

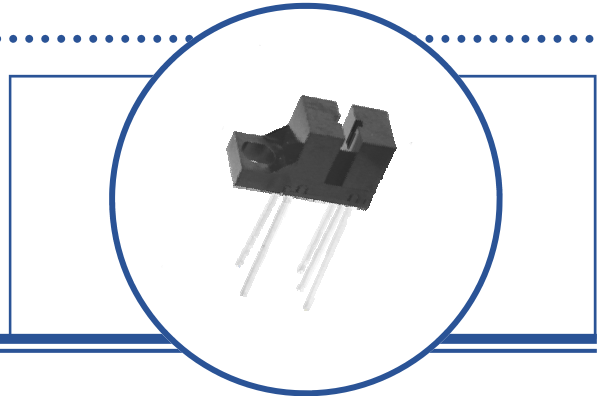
# Photologic® Slotted Optical Switch

OPB120A, OPB120B, OPB121A, OPB121B  
OPB122A, OPB122B, OPB123A, OPB123B



## Features:

- Choice of output configuration
- Printed circuit board mounting
- Opaque plastic housing
- Low profile
- 0.080" (2.03 mm) wide slot
- 0.275" (6.99 mm) lead spacing



## Description:

The **OPB120** through **OPB123** devices consist of an infrared emitting diode and a Photologic® sensor (which is a monolithic integrated circuit that incorporates a linear amplifier and a Schmitt Trigger). The **OPB120** series have an LED and Photologic® sensor mounted on opposite sides of a 0.080" (2.03 mm) wide gap of an opaque housing. The OPB12\_A series have a molded 0.040" (1.02 mm) wide apertures located over both the emitter and the Photologic® sensor. The OPB12\_B series have a molded 0.040" (1.016 mm) wide apertures located over the emitter and 0.010" (0.254 mm) over the Photologic® sensor. All devices in this series have the added stability utilizing hysteresis built into the amplification circuitry.

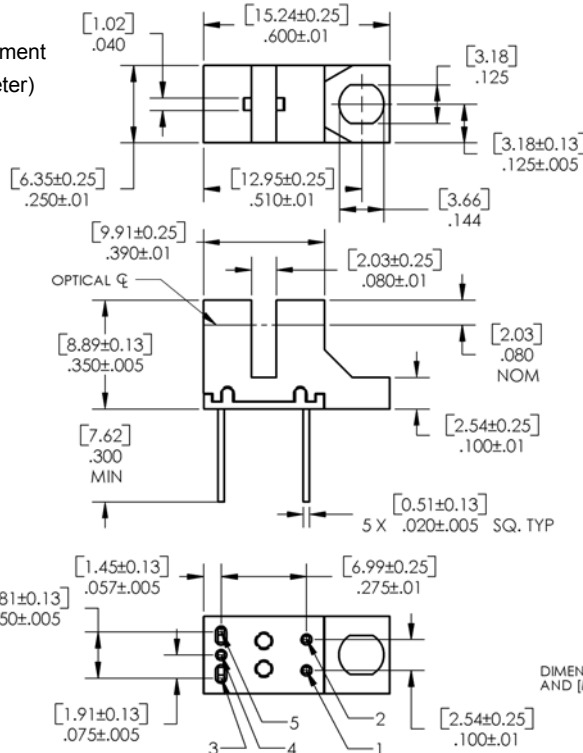
The electrical output can be specified as either buffered Totem-Pole (**OPB 120A, OPB120B**), buffered Open-Collector (**OPB121A, OPB121B**), Inverted Totem-Pole (**OPB122A, OPB122B**), or Inverted Open-Collector (**OPB123A, OPB123B**).

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
- Object sensing

Pin #	Description
1	Anode
2	Cathode
3	V <sub>CC</sub>
4	Output
5	Ground



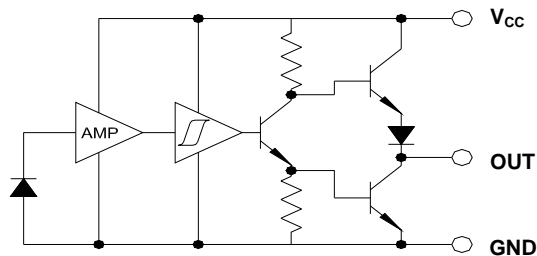
Ordering Information		
Part Number	Sensor Photologic®	Aperture Emitter/Sensor
OPB120A	Totem-Pole	0.04" / 0.04"
OPB120B		0.04" / 0.01"
OPB121A	Open-Collector	0.04" / 0.04"
OPB121B		0.04" / 0.01"
OPB122A	Inverted Totem-Pole	0.04" / 0.04"
OPB122B		0.04" / 0.01"
OPB123A	Inverted Open-Collector	0.04" / 0.04"
OPB123B		0.04" / 0.01"



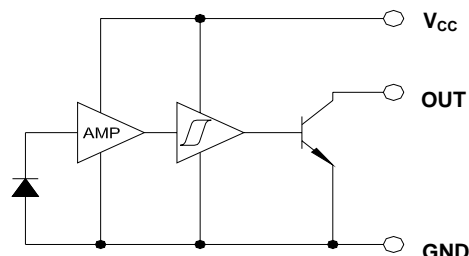
RoHS

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

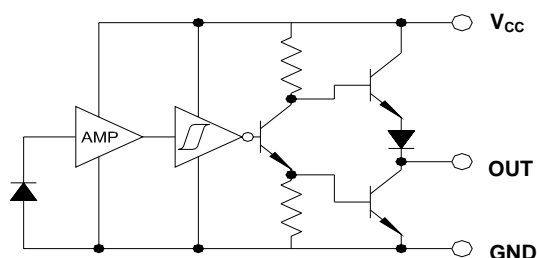
**OPB120 Buffered Totem-Pole**



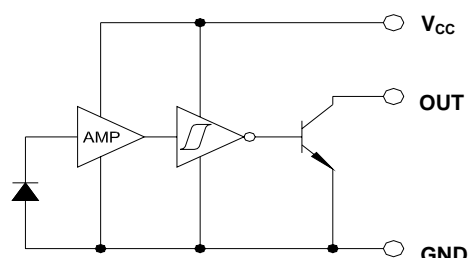
**OPB121 Buffered Open-Collector**



**OPB122 Inverted Totem-Pole**



**OPB123 Inverted Open-Collector**



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

Supply Voltage (not to exceed 3 seconds)	10 V
Storage Temperature	-40° C to +85° C
Operating Temperature	-40° C to +70° C
Lead Soldering Temperature (1/16" (1.6 mm) from case for 5 seconds with soldering iron) <sup>(1)</sup>	260° C

**Input Infrared Diode**

Input Diode Power Dissipation <sup>(2)</sup>	100 mW
Output Photologic® Power Dissipation <sup>(4)</sup>	200 mW
Total Device Power Dissipation <sup>(5)</sup>	300 mW

**Output Photologic®**

Voltage at Output Lead (Open Collector Output - OPB121, OPB122, OPB123)	35 V
Forward D.C. Current	40 mA
Reverse D.C. Current	2 V

Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (2) Derate linearly 2.22 mW/°C above 25°C
- (3) Normal application would be with light source blocked, simulated by  $I_F = 0$ .
- (4) Derate linearly 4.44 mW/°C above 25°C
- (5) Derate linearly 6.66 mW/°C above 25°C
- (6) Applies to Totem Pole configurations (OPB120A, OPB120B) only.
- (7) All parameters tested using pulse technique.

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**  
**OPB120A, OPB120B, OPB121A, OPB121B**  
**OPB122A, OPB122B, OPB123A, OPB123B**



**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** (see OP240 for additional information)

$V_F$	Forward Voltage	-	-	1.7	V	$I_F = 20\text{ mA}$ , $T_A = 25^\circ\text{C}$
$I_R$	Reverse Current	-	-	100	$\mu\text{A}$	$V_R = 2\text{ V}$ , $T_A = 25^\circ\text{C}$

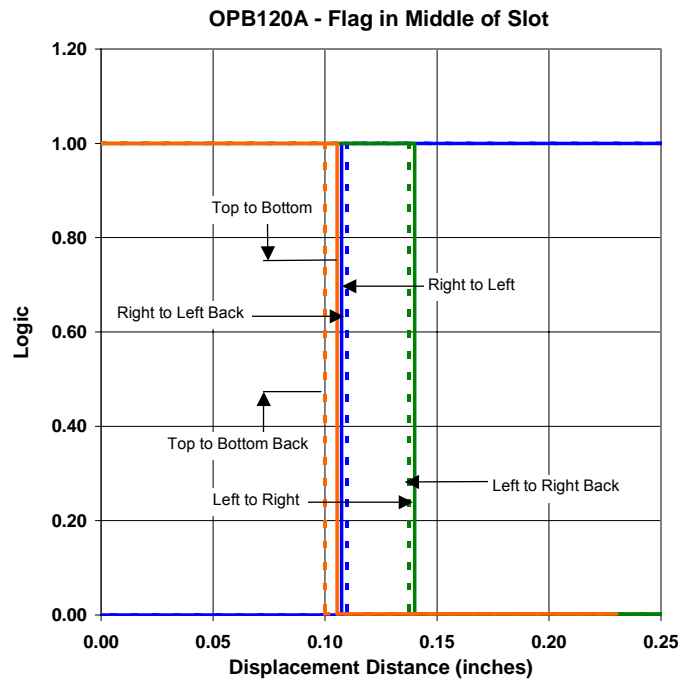
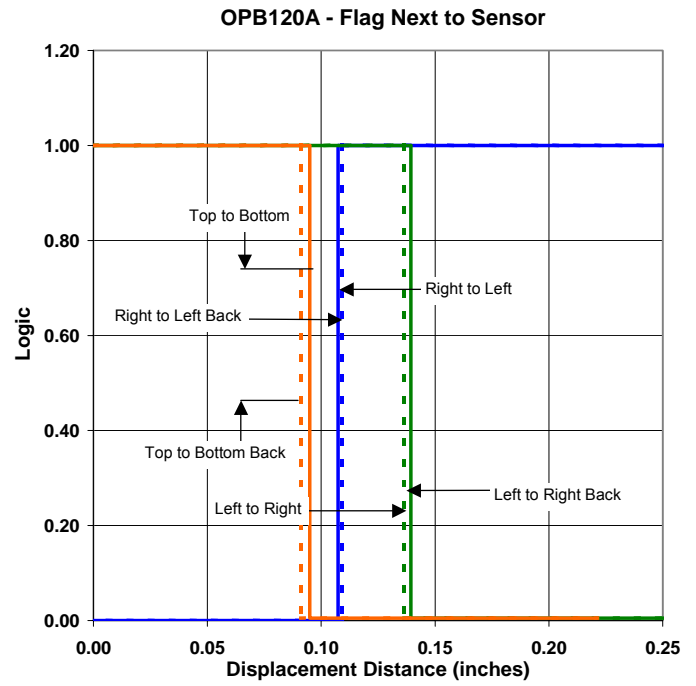
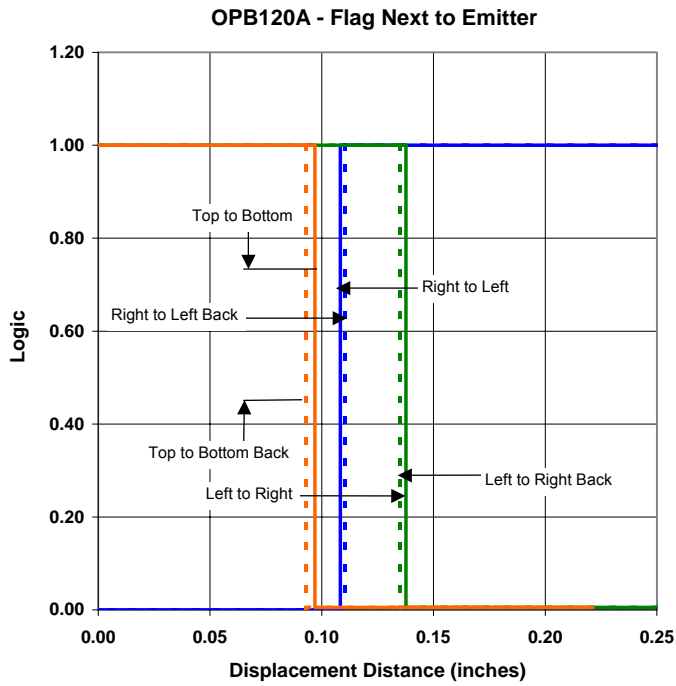
**Output Photologic® Sensor** (see OPL560 for additional information)

$V_{CC}$	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	$V_{CC} = 5.25\text{ V}$ , $I_F = 0\text{ mA}^{(1)}$
	Inverted Totem-Pole Output Inverted Open-Collector Output	-	-	15	mA	$V_{CC} = 5.25\text{ V}$ , $I_F = 20\text{ mA}$
$I_{CCH}$	High Level Supply Current: Buffered Totem-Pole Output Buffered Open-Collector Output	-	-	15	mA	$V_{CC} = 5.25\text{ V}$ , $I_F = 20\text{ mA}$
	Inverted Totem-Pole Output Inverted Open-Collector Output	-	-	15	mA	$V_{CC} = 5.25\text{ V}$ , $I_F = 0\text{ mA}^{(1)}$
$V_{OL}$	Low Level Output Voltage: Buffered Totem-Pole Output Buffered Open-Collector Output	-	-	0.4	V	$V_{CC} = 4.75\text{ V}$ , $I_{OL} = 12.8\text{ mA}$ , $I_F = 0\text{ mA}^{(1)}$
	Inverted Totem-Pole Output Inverted Open-Collector Output	-	-	0.4	V	$V_{CC} = 4.75\text{ V}$ , $I_{OL} = 12.8\text{ mA}$ , $I_F = 20\text{ mA}$
$V_{OH}$	High Level Output Voltage: Buffered Totem-Pole Output	2.4	-	-	V	$V_{CC} = 4.75\text{ V}$ , $I_{OH} = -800\text{ }\mu\text{A}$ , $I_F = 20\text{ mA}$
	Inverted Totem-Pole Output	2.4	-	-	V	$V_{CC} = 4.75\text{ V}$ , $I_{OH} = -800\text{ }\mu\text{A}$ , $I_F = 0\text{ mA}^{(1)}$
$I_{OH}$	High Level Output Voltage: Buffered Open-Collector Output	-	-	100	$\mu\text{A}$	$V_{CC} = 4.75\text{ V}$ , $V_{OH} = 30\text{ V}$ , $I_F = 25\text{ mA}$ , $T_A = 25^\circ\text{C}$
	Inverted Open-Collector Output	-	-	100	$\mu\text{A}$	$V_{CC} = 4.75\text{ V}$ , $V_{OH} = 30\text{ V}$ , $I_F = 0\text{ mA}$ , $T_A = 25^\circ\text{C}$
$I_F(+)$	LED Positive-Going Threshold Current	-	-	15	mA	$V_{CC} = 5\text{ V}$ , $T_A = 25^\circ\text{C}$
$I_F(+)/I_F(-)$	Hysteresis	-	2	-	-	$V_{CC} = 5\text{ V}$
$I_{OS}$	Short Circuit Output Current: Buffered Totem-Pole Output	-20	-	-100	mA	$V_{CC} = 5.25\text{ V}$ , $I_F = 20\text{ mA}^{(2)}$ Output = GND
	Inverted Totem-Pole Output	-20	-	-100	mA	$V_{CC} = 5.25\text{ V}$ , $I_F = 0\text{ mA}^{(2)}$ Output = GND
$t_r, t_f$	Output Rise Time, Output Fall Time	-	70	-	ns	$V_{CC} = 5\text{ V}$ , $T_A = 25^\circ\text{C}$ $I_F = 0$ or $20\text{ mA}$
$t_{PLH}, t_{PHL}$	Propagation Delay Low-High & High-Low	-	5	-	$\mu\text{s}$	$R_L = 8\text{ TTL Loads (Totem-Pole)}$ $R_L = 360\text{ }\Omega$ (Open-Collector)

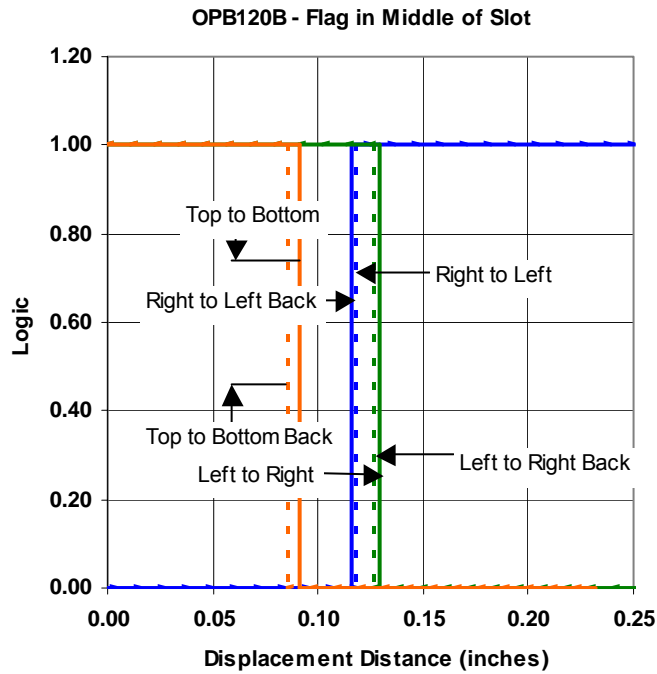
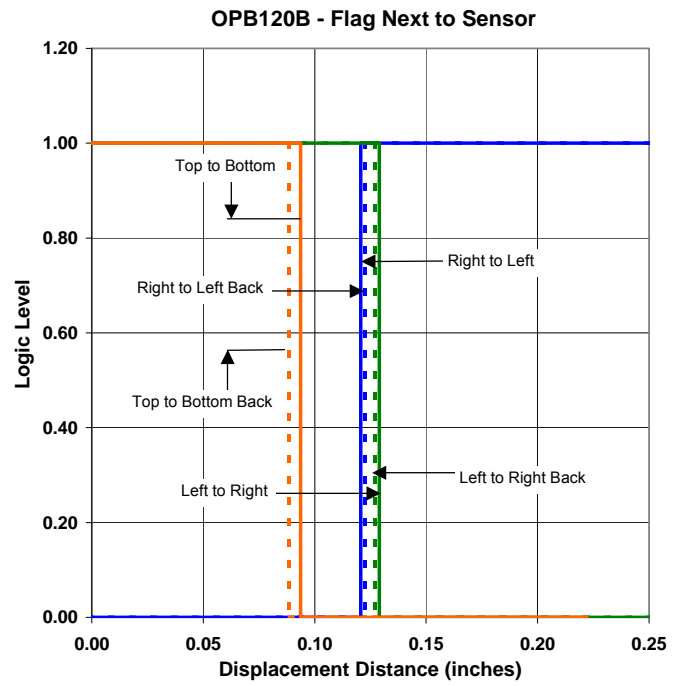
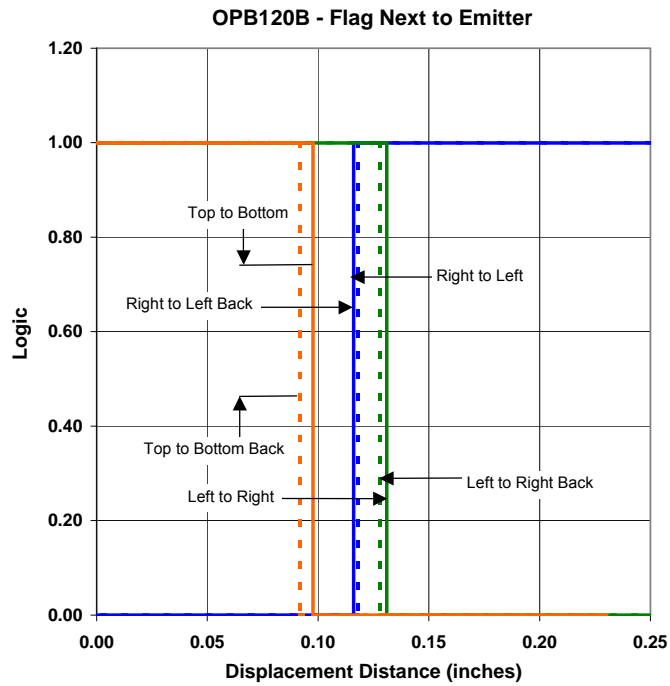
Notes:

(1) Normal application would be with light source blocked, simulated by  $I_F = 00$ .

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



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



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