

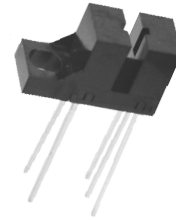
# Photologic® Slotted Optical Switch



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.

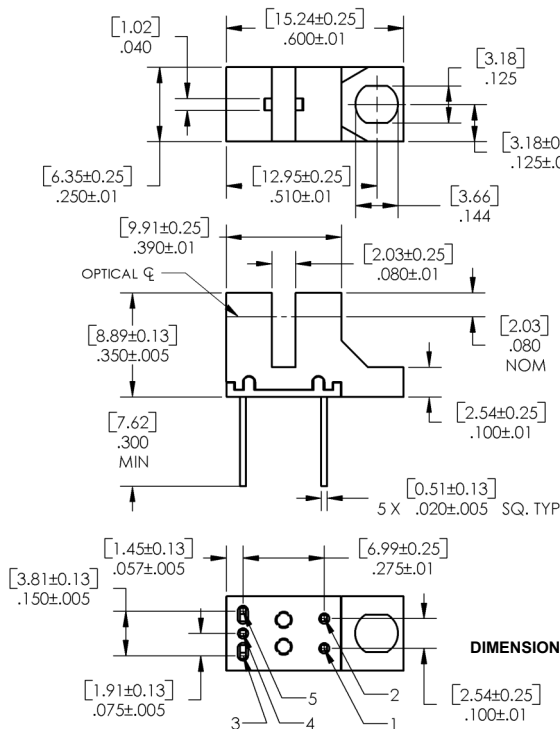
The electrical output can be specified as either buffered Totem-Pole (**OPB 120A, OPB120B**), buffered Open-Collector (**OPB121A, OPB121B**), Inverted Totem-Pole (**OPB122A, OPB122B**), or Inverted Open-Collector (**OPB123A, OPB123B**).

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	Cathode
2	Anode
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"



General Note  
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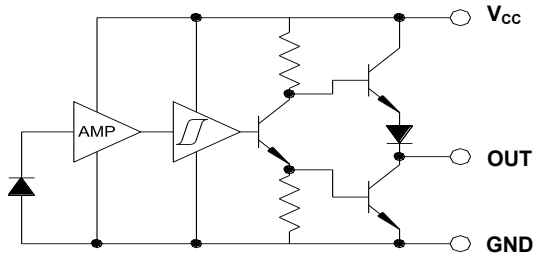
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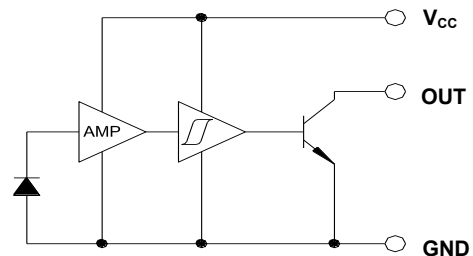


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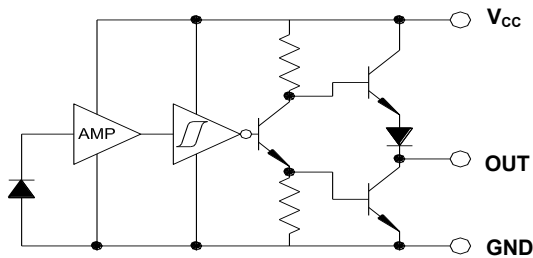
**OPB120 Buffered Totem-Pole**



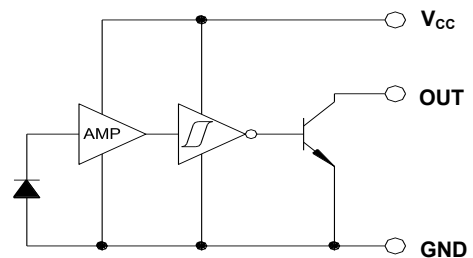
**OPB121 Buffered Open-Collector**



**OPB122 Inverted Totem-Pole**



**OPB123 Inverted Open-Collector**



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## Electrical Specifications

Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)	
Supply Voltage (not to exceed 3 seconds)	10 V
Storage Temperature	$-40^\circ\text{C}$ to $+85^\circ\text{C}$
Operating Temperature	$-40^\circ\text{C}$ to $+70^\circ\text{C}$
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.

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Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>Input Diode</b> (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	$\mu\text{A}$	$V_R = 2\text{ V}$ , $T_A = 25^\circ\text{C}$
<b>Output Photologic® Sensor</b> (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	-	-	$V_{CC} = 5\text{ V}$

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Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
$I_{OS}$	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	-	$\mu\text{s}$	$R_L = 8\text{ TTL Loads (Totem-Pole)}$ $R_L = 360\ \Omega$ (Open-Collector)

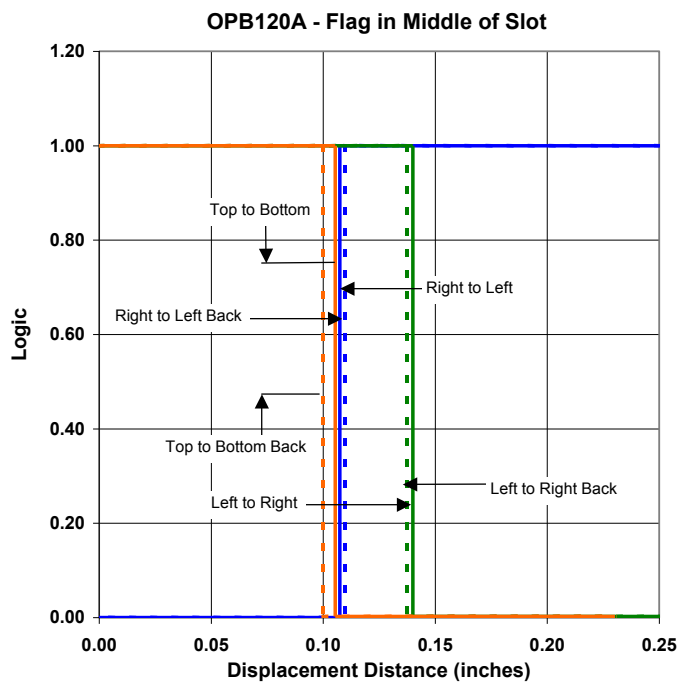
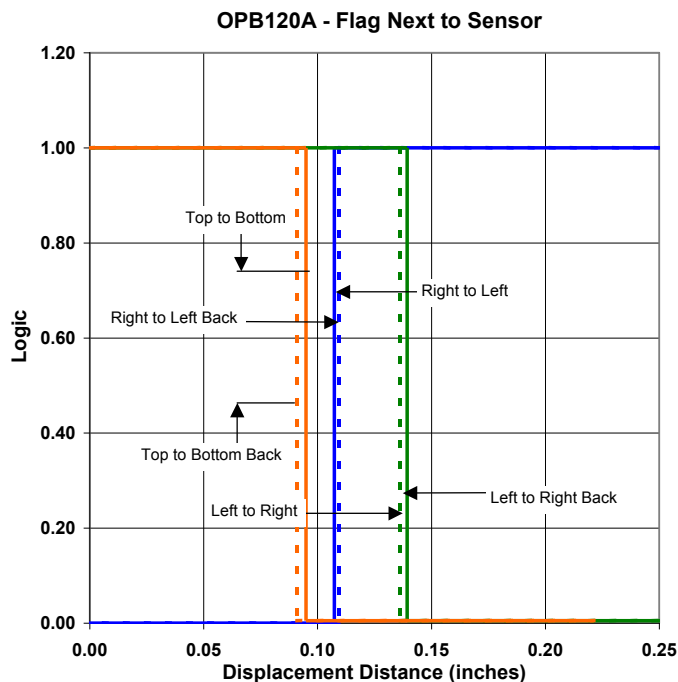
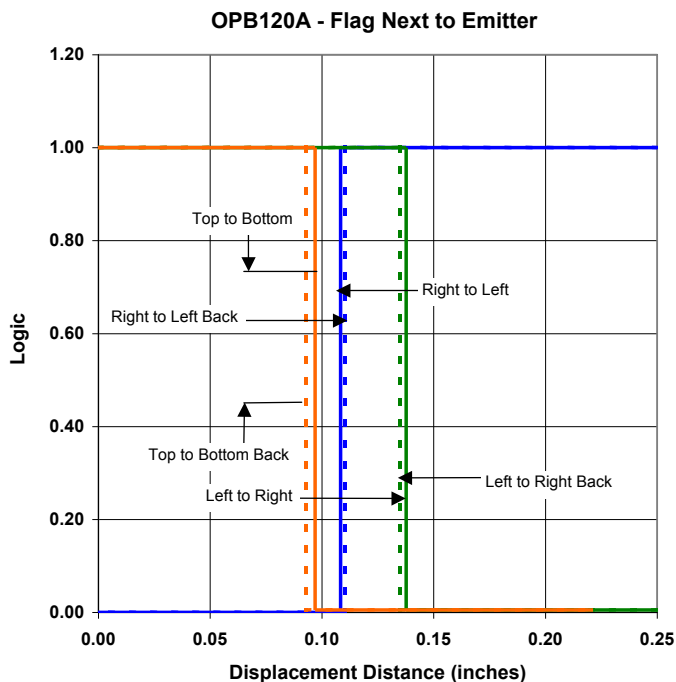
Notes:

- (1) Normal application would be with light source blocked, simulated by  $I_F = 00$ .
- (2) Applies to Totem Pole configurations (OPB120A, OPB120B) only.

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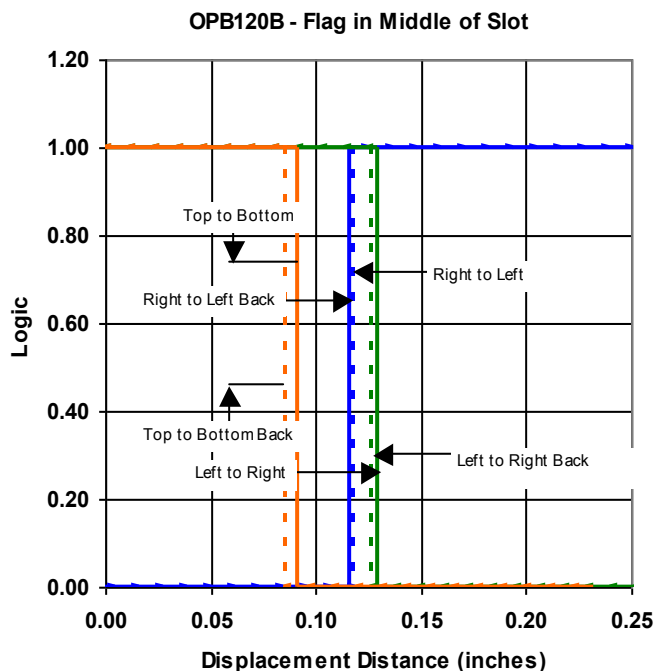
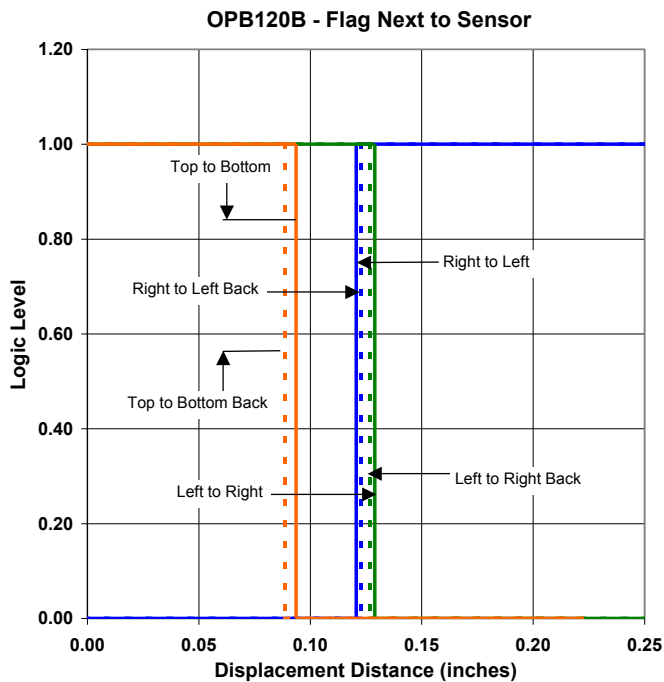
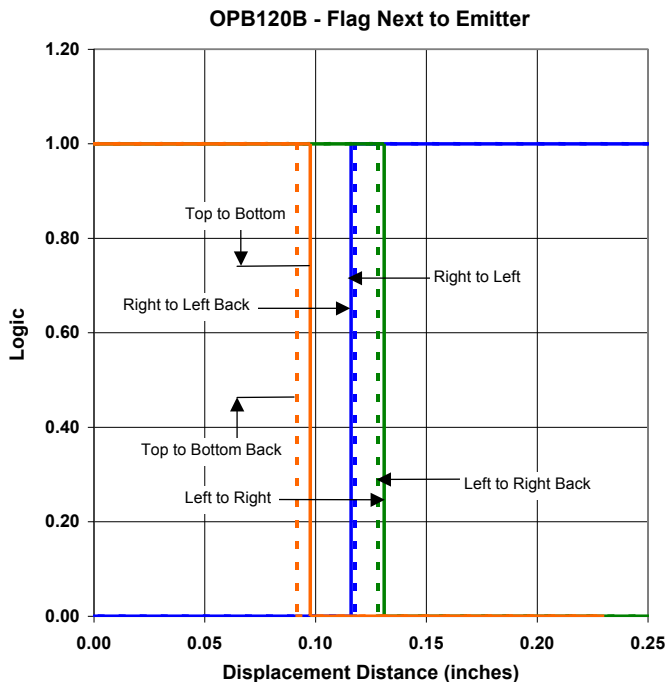
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