

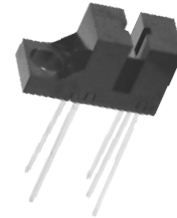
Photologic® Slotted Optical Switch



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.

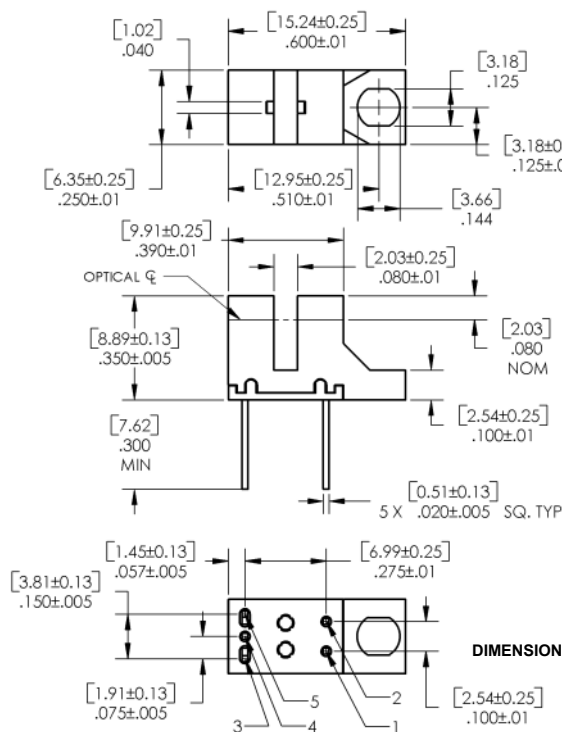
The electrical output can be specified as either buffered Totem-Pole (**OPB 120A, OPB120B**), buffered Open-Collector (**OPB121A, OPB121B**), Inverted Totem-Pole (**OPB122A, OPB122B**), or Inverted Open-Collector (**OPB123A, OPB123B**).

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 _{CC}
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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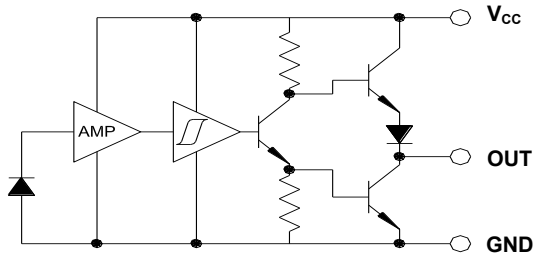
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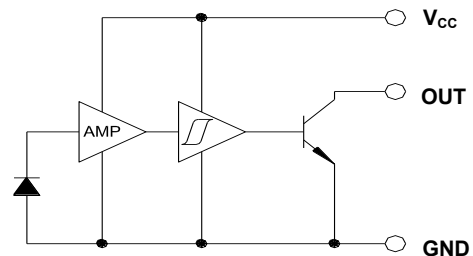


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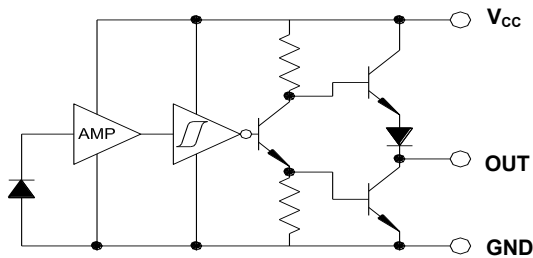
OPB120 Buffered Totem-Pole



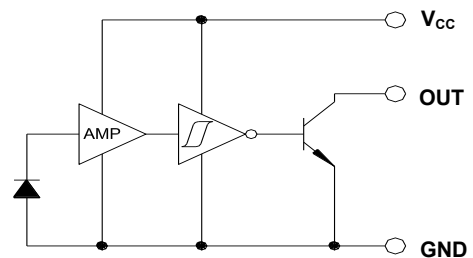
OPB121 Buffered Open-Collector



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°C to $+85^\circ\text{C}$
Operating Temperature	-40°C to $+70^\circ\text{C}$
Lead Soldering Temperature (1/16" (1.6 mm) from case for 5 seconds with soldering iron) ⁽¹⁾	260° C
Input Infrared Diode	
Input Diode Power Dissipation ⁽²⁾	100 mW
Output Photologic® Power Dissipation ⁽⁴⁾	200 mW
Total Device Power Dissipation ⁽⁵⁾	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° 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 mA, T _A = 25° C
I _R	Reverse Current	-	-	100	μA	V _R = 2 V, T _A = 25° 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 V, I _F = 0 mA ⁽¹⁾
	Inverted Totem-Pole Output Inverted Open-Collector Output	-	-	15	mA	V _{CC} = 5.25 V, I _F = 20 mA
I _{CCH}	High Level Supply Current: Buffered Totem-Pole Output Buffered Open-Collector Output	-	-	15	mA	V _{CC} = 5.25 V, I _F = 20 mA
	Inverted Totem-Pole Output Inverted Open-Collector Output	-	-	15	mA	V _{CC} = 5.25 V, I _F = 0 mA ⁽¹⁾
V _{OL}	Low Level Output Voltage: Buffered Totem-Pole Output Buffered Open-Collector Output	-	-	0.4	V	V _{CC} = 4.75 V, I _{OL} = 12.8 mA, I _F = 0 mA ⁽¹⁾
	Inverted Totem-Pole Output Inverted Open-Collector Output	-	-	0.4	V	V _{CC} = 4.75 V, I _{OL} = 12.8 mA, I _F = 20 mA
V _{OH}	High Level Output Voltage: Buffered Totem-Pole Output	2.4	-	-	V	V _{CC} = 4.75 V, I _{OH} = -800 μA, I _F = 20 mA
	Inverted Totem-Pole Output	2.4	-	-	V	V _{CC} = 4.75 V, I _{OH} = -800 μA, I _F = 0 mA ⁽¹⁾
I _{OH}	High Level Output Voltage: Buffered Open-Collector Output	-	-	100	μA	V _{CC} = 4.75 V, V _{OH} = 30 V, I _F = 25 mA, T _A = 25° C
	Inverted Open-Collector Output	-	-	100	μA	V _{CC} = 4.75 V, V _{OH} = 30 V, I _F = 0 mA, T _A = 25° C
I _F (+)	LED Positive-Going Threshold Current	-	-	15	mA	V _{CC} = 5 V, T _A = 25° C
I _F (+)/I _F (-)	Hysteresis	-	2	-	-	V _{CC} = 5 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 mA
t_{PLH}, t_{PHL}	Propagation Delay Low-High & High-Low	-	5	-	μs	$R_L = 8\text{ TTL Loads (Totem-Pole)}$ $R_L = 360\ \Omega$ (Open-Collector)

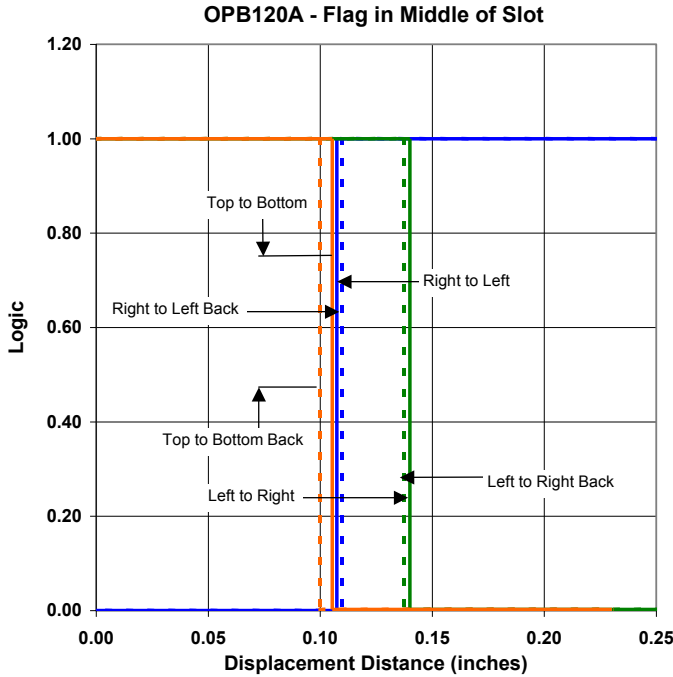
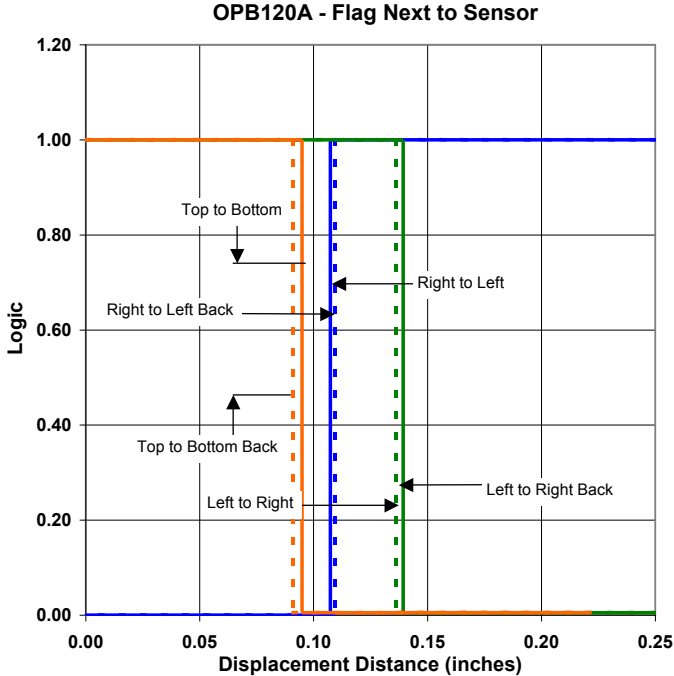
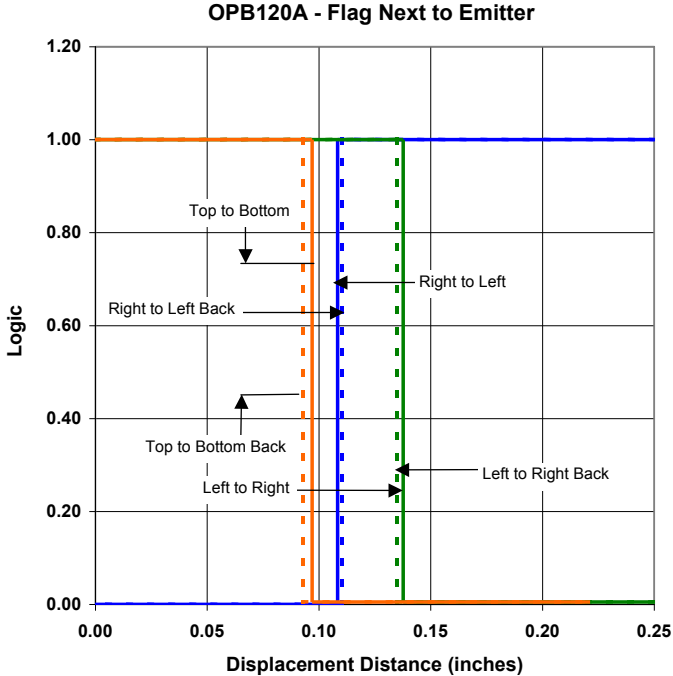
Notes:

- (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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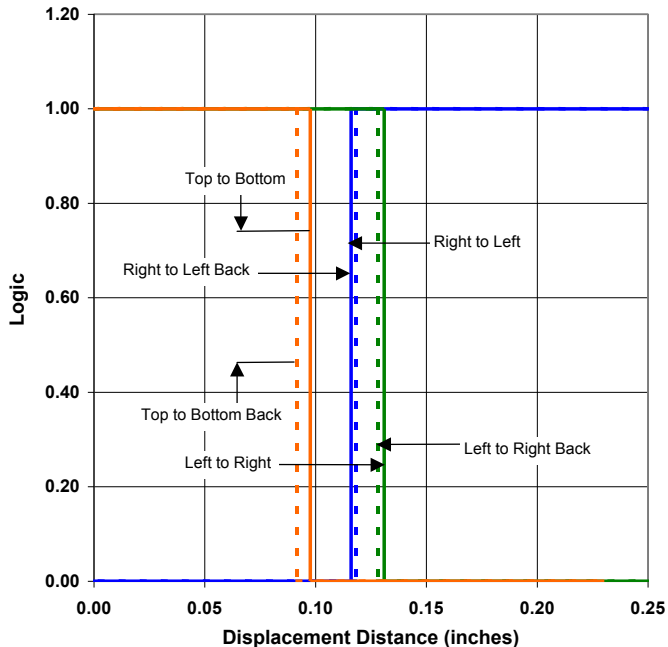
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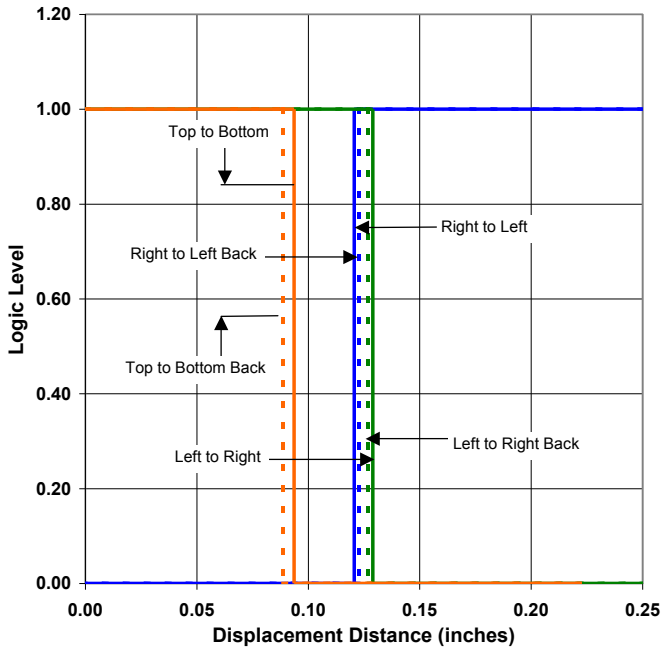


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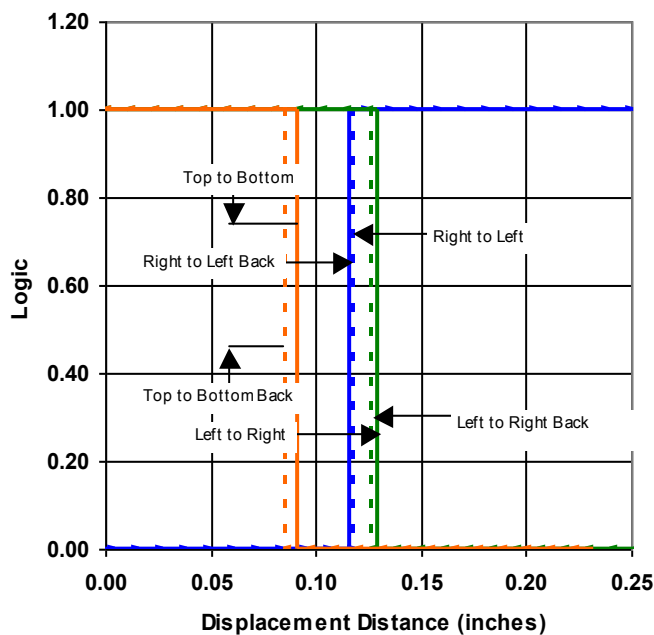
OPB120B - Flag Next to Emitter



OPB120B - Flag Next to Sensor



OPB120B - Flag in Middle of Slot



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