Photologic® Slotted Optical Switch

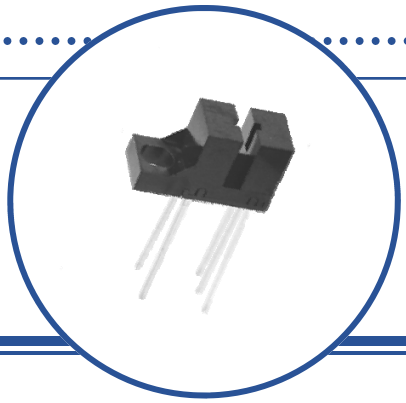
OPB120A, OPB120B, OPB121A, OPB121B

OPB122A, OPB122B, OPB123A, OPB123B

TT electronics
OPTEK Technology

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 seriesseries 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.

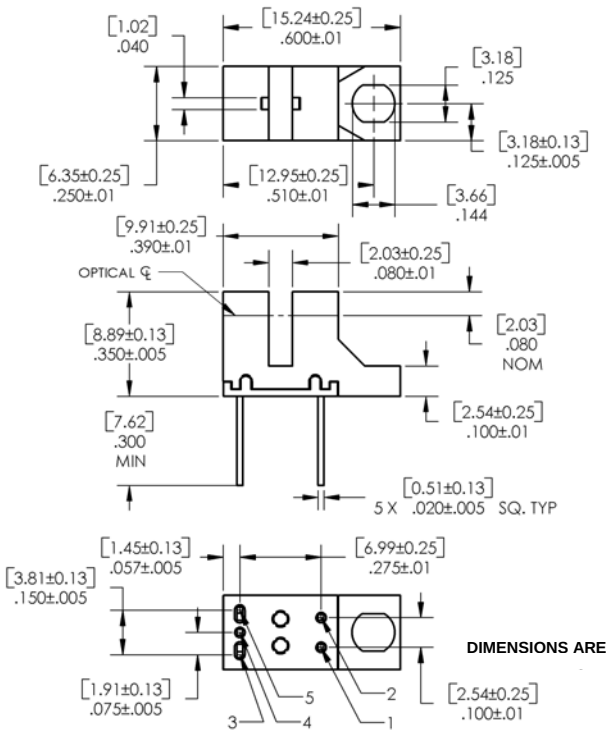
The electrical output can be specified as either buffered Totem-Pole **(OPB 120A, OPB120B)**, buffered Open-Collector **(OPB121A, OPB121B)**, Inverted Totem-Pole **(OPB122A, OPB122B)**, or Inverted Open-Collector **(OPB123A, OPB123B)**.

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



DIMENSIONS ARE IN: **[MILLIMETERS]** **INCHES**

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"

Pb
RoHS

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

OPTEK Technology Inc. — 1645 Wallace Drive, Carrollton, Texas 75006
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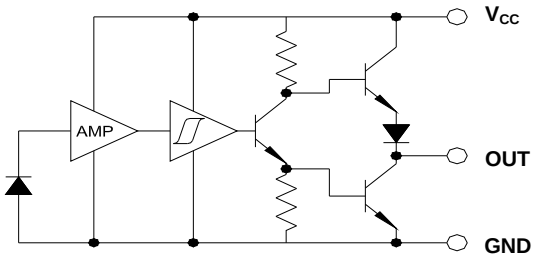
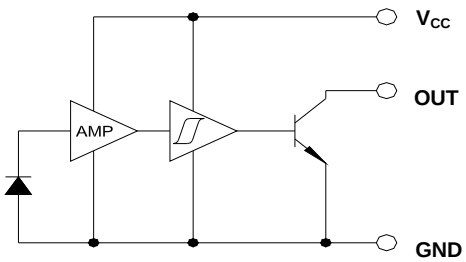
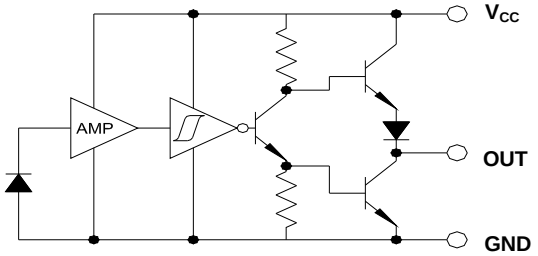
OPB120 Buffered Totem-Pole



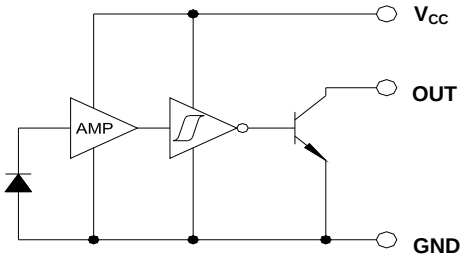
OPB121 Buffered Open-Collector



OPB122 Inverted Totem-Pole



OPB123 Inverted Open-Collector



Absolute Maximum Ratings (T_A = 25°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)(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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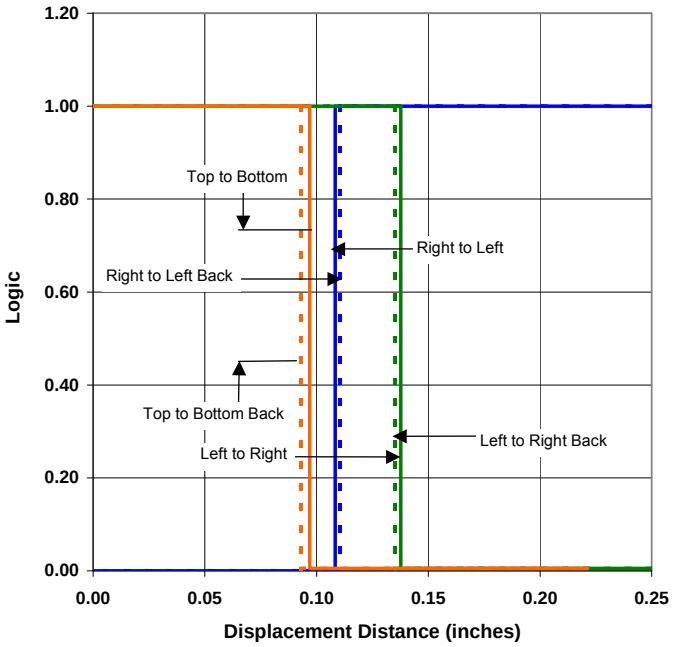
Electrical Characteristics (T_A = 40°C to + 70° unless otherwise noted)

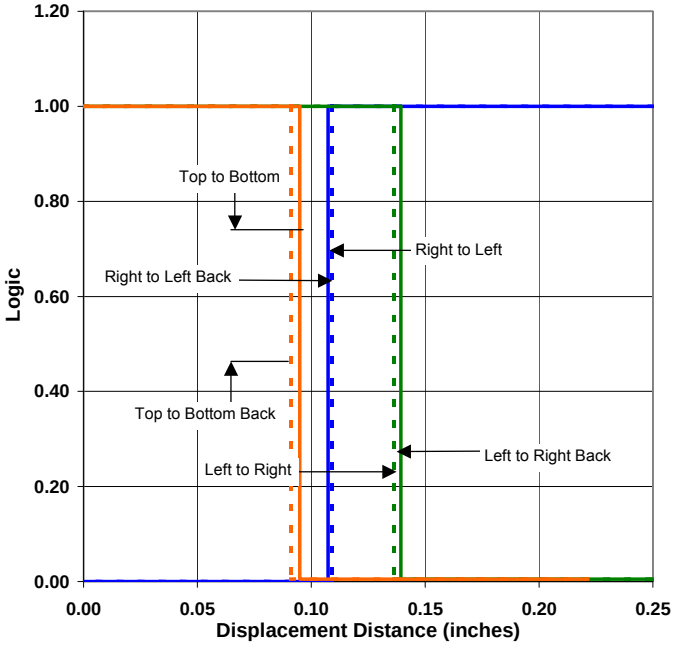
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode (see OP240 for additional information)						
V_F	Forward Voltage	-	-	1.7	V	I_F = 20 mA, T_A = 25° C
I_R	Reverse Current	-	-	100	µA	V_R = 2 V, T_A = 25° C
Output Photologic® Sensor (see OPL560 for additional information)						
V_{CC}	Operating 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
I_{OS}	Short Circuit Output Current: Buffered Totem-Pole Output	-20	-	-100	mA	V_{CC} = 5.25 V, I_F = 20 mA(2) Output = GND
	Inverted Totem-Pole Output	-20	-	-100	mA	V_{CC} = 5.25 V, I_F = 0 mA(2) Output = GND
t_r, t_f	Output Rise Time, Output Fall Time	-	70	-	ns	V_{CC} = 5 V, T_A = 25° C I_F = 0 or 20 mA R_L = 8 TTL Loads (Totem-Pole) R_L = 360 Ω (Open-Collector)
t_{PLH}, t_{PHL}	Propagation Delay Low-High & High-Low	-	5	-	µs	

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

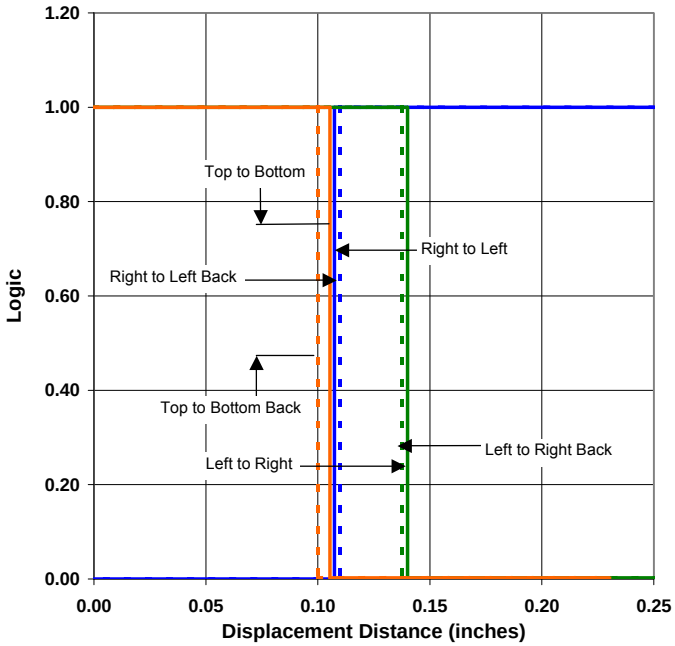
OPB120A - Flag Next to Emitter



OPB120A - Flag Next to Sensor



OPB120A - Flag in Middle of Slot



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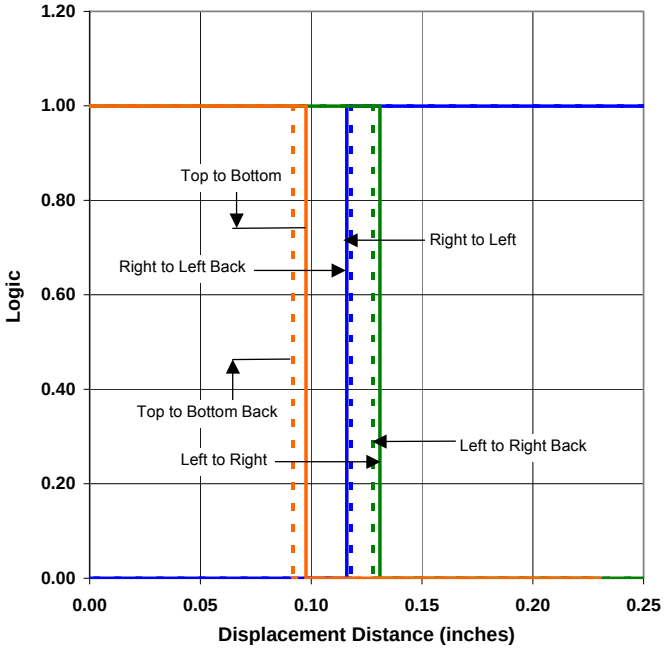
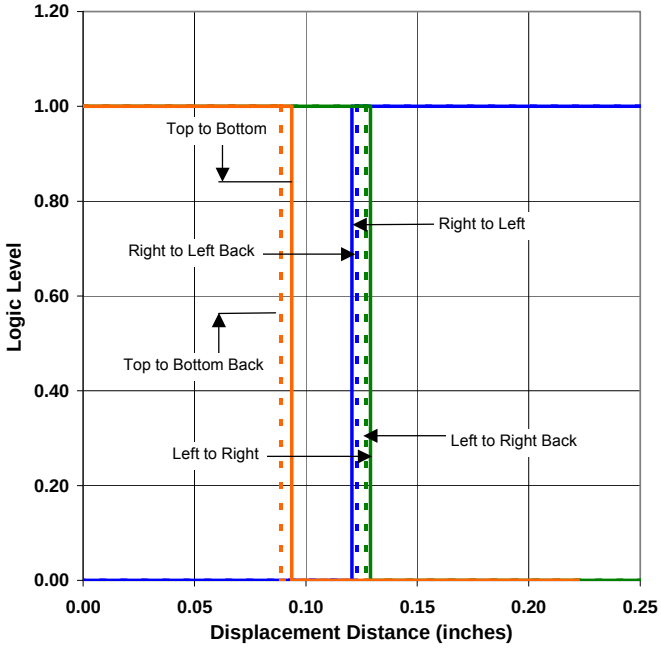
OPB120B - Flag Next to Emitter



OPB120B - Flag Next to Sensor



OPB120B - Flag in Middle of Slot