Photologic® Slotted Optical Switch
"Wide Gap" Series

OPB900 through OPB913 Series (L, W_Z)

L Series



W Series



Features:

- 0.375" (9.5 mm) wide gap
- Choice of logical output configurations
- Choice of opaque or IR transmissive housing material
- Choice of printed circuit board mounting or 24" #26 AWG, UL rated wire
- Data rates to 250 kBaud

Description:

The **OPB900** - **OPB913** series of Photologic® Integrated Circuit Switches provide optimum flexibility for the design engineer. Building from a standard housing with a 0.375" (9.5 mm) wide slot, a user can specify the type and polarity of the TTL output and the type of shell material.

Electrical output can be specified as either TTL Totem Pole (buffered) or TTL Open Collector, either of which can be supplied with an inverted output polarity.

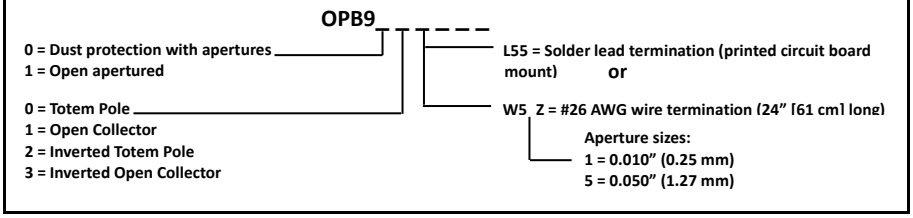
All versions have the added stability of hysteresis built into the amplification circuitry.

Custom electrical, wire and cabling and connectors are available. Contact your local representative or OPTEK for more information.

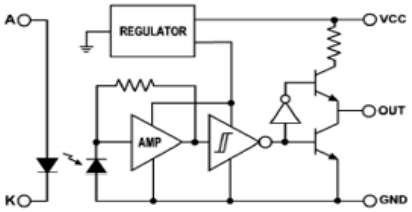
Applications:

- Mechanical switch replacement
- Speed indication (tachometer)
- Mechanical limit indication
- Edge sensing
- Object sensing

Part Number Guide — OPB900 Series (L, W)

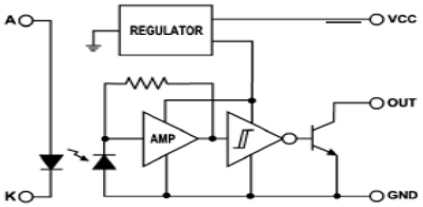


Totem-Pole-Output



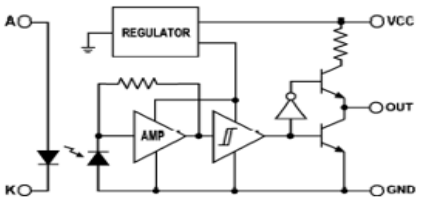
Light On — Output High

Open-Collector-Output



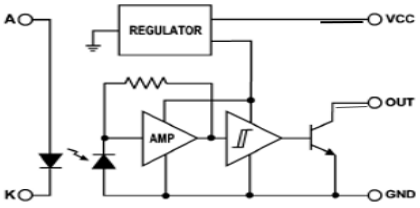
Light On — Output High

Inverted Totem-Pole



Light On — Output Low

Inverted Open Collector



Light On — Output Low

RoHS

General Note
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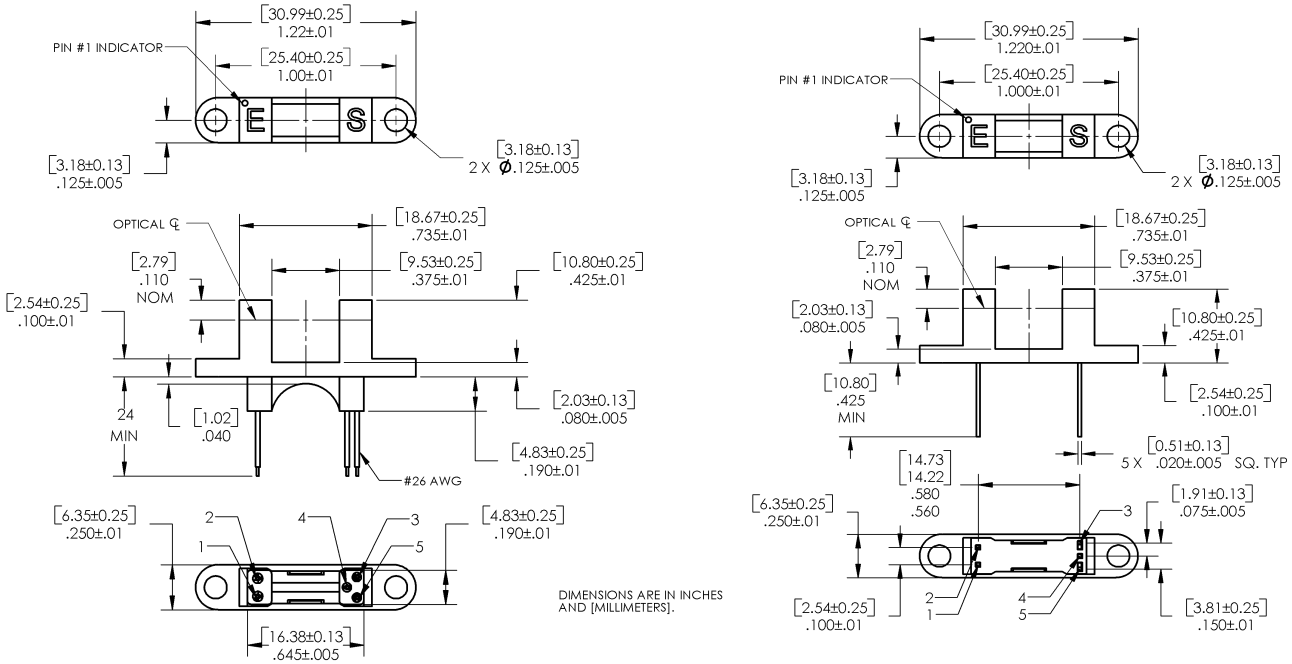
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OPB900 through OPB913 Series (L, W_Z)

Electrical Specifications



Color-Pin #	Description	Color-Pin #	Description	Color-Pin #	Description	Color-Pin #	Description	Color-Pin #	Description
Red-1	Anode	**Black**-2	Cathode	**White**-3	V_{CC}	**Blue**-4	Output	**Green**-5	Ground

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

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) (4)	260° C
Infrared LED	
DC Forward Diode (LED) Current	40 mA
DC Reverse Diode (LED) Voltage	2 V
Input Diode Power Dissipation (1)	100 mW
Output Photologic ®	
Supply Voltage, V_{CC} (not to exceed 3 seconds)	18 V
Voltage at Output Lead (Open Collector Output version)	35 V
Output Photologic® Power Dissipation (2)	200 mW
Total Device Power Dissipation (3)	300 mW

Notes:
(1) Derate linearly 1.77 mW/° C above 25° C
(2) Derate linearly 2.50 mW/° C above 25° C
(3) Derate linearly 4.27 mW/° C above 25° C
(4) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
(5) Methanol or isopropanol are recommended as cleaning agents. The plastic housing is soluble in chlorinated hydrocarbons and ketones.

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Electrical Specifications

Electrical Characteristics (T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage	1.0	-	1.7	V	I_F = 20 mA
I_R	Reverse Current	-	-	100	µA	V_R = 2 V
Output Photologic® Sensor						
V_{CC}	Operating D.C. Supply Voltage	4.5	-	16	V	
I_{CCL} (1)	Low Level Supply Current: Buffered Totem-Pole Output Buffered Open-Collector Output	-	-	15	mA	V_{CC} = 16 V, I_F = 0 mA
	Inverted Totem-Pole Output Inverted Open-Collector Output					V_{CC} = 16 V, I_F = 20 mA
I_{CCH} (1)	High Level Supply Current: Buffered Totem-Pole Output Buffered Open-Collector Output	-	-	0.4	V	V_{CC} = 16 V, I_F = 20 mA
	Inverted Totem-Pole Output Inverted Open-Collector Output					V_{CC} = 16 V, I_F = 0 mA
V_{OL} (1)	Low Level Supply Voltage: Buffered Totem-Pole Output Buffered Open-Collector Output	-	-	0.4	V	V_{CC} = 4.5 V, I_{OL} = 16 mA, I_F = 0 mA
	Inverted Totem-Pole Output Inverted Open-Collector Output					V_{CC} = 4.5 V, I_{OL} = 16 mA, I_F = 20 mA
V_{OH} (1)	High Level Output Voltage: Buffered Totem-Pole Output	V_{CC} - 2.1	-	-	V	V_{CC} = 4.5 V, I_{OH} = -800 µA, I_F = 20 mA
	Inverted Totem-Pole Output					V_{CC} = 4.5 V, I_{OH} = -800 µA, I_F = 0 mA
I_{OH}	High Level Output Current: Buffered Open-Collector Output	-	-	100	µA	V_{CC} = 4.5 V to 16 V, V_{OH} = 30 V, T_A = 25° C, I_F = 20 mA
	Inverted Open-Collector Output					V_{CC} = 4.5 V to 16 V, V_{OH} = 30 V, T_A = 25° C, I_F = 0 mA
$I_F(+)$	LED Positive-Going Threshold Current	-	-	20	mA	V_{CC} = 5 V, T_A = 25° C
$I_F(+)/I_F(-)$	Hysteresis	-	1.5	2.0	-	V_{CC} = 5 V
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 and High-Low	-	5	-	µs	

Notes:
(1) Normal application would be with light source blocked, simulated by I_F = 0 mA.

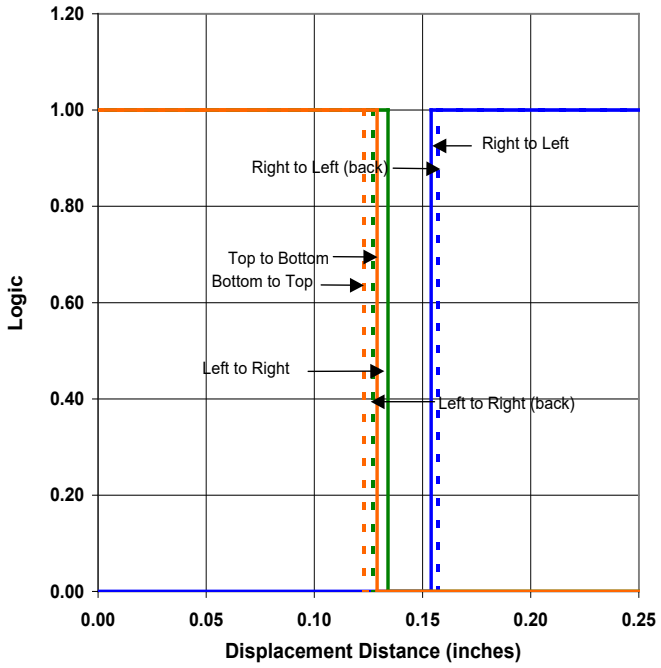
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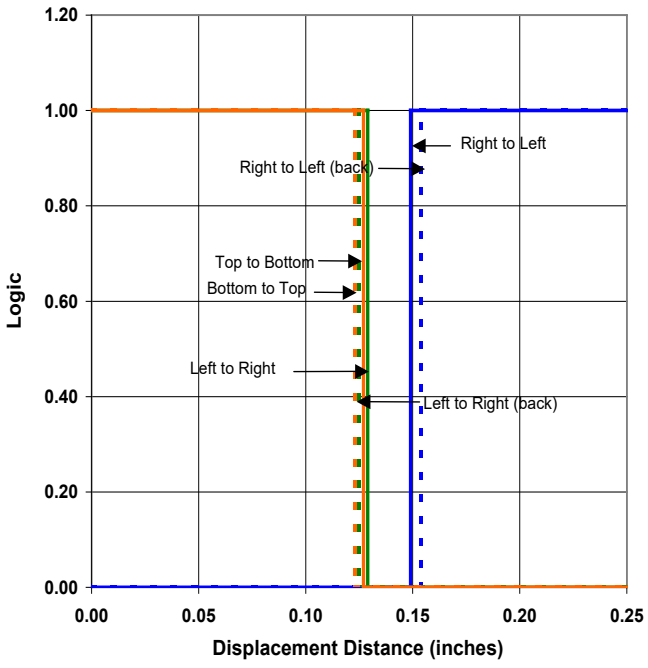
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Typical Performance

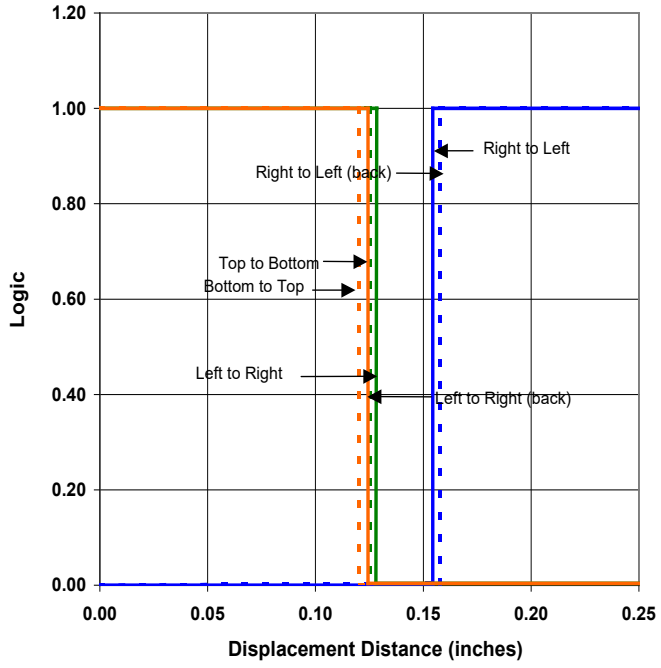
OPB900 - Flag Next to Emitter

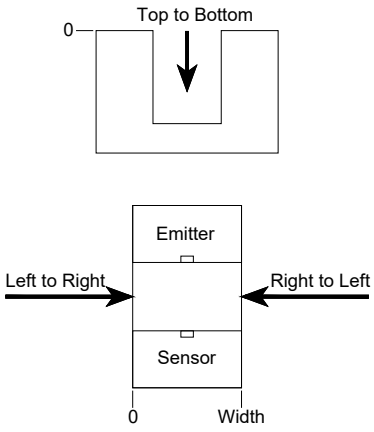


OPB900 - Flag Next to Sensor



OPB900 - Flag in Middle of Slot





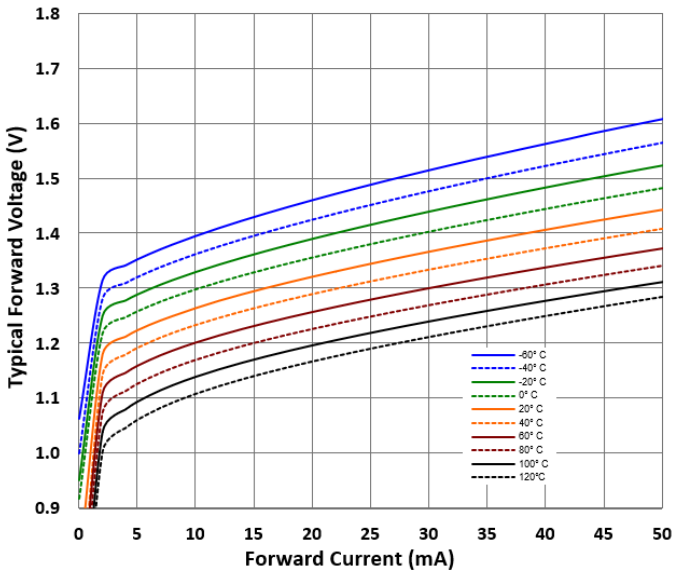
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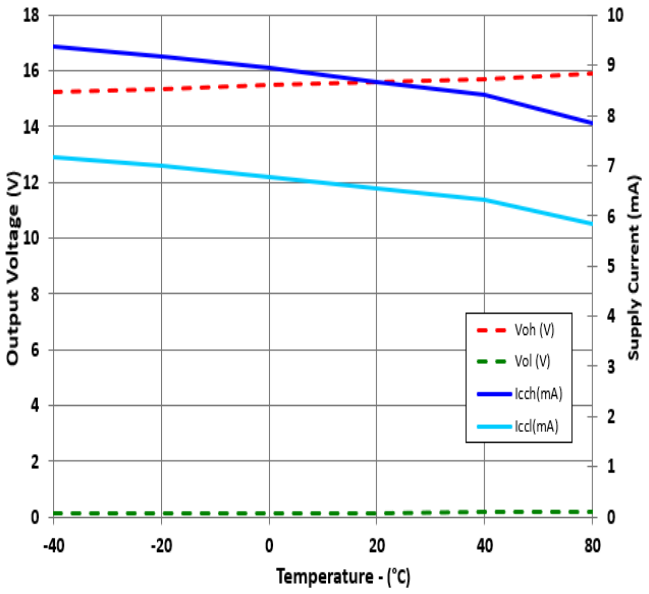
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Typical Performance

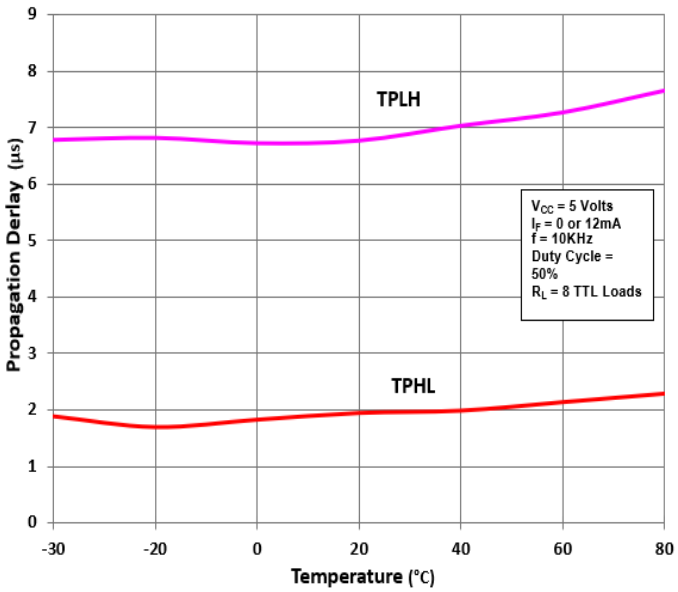
LED Forward Voltage vs I_F vs Temp



Output Voltage and Supply Current Vs Temperature



Propagation Delay Vs Temperature



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