

# Photologic® Slotted Optical Switch



## OPB916 Series

### Features:

- Low power consumption
- Data rates to 250 kBaud
- Choice of two logic states and two electrical outputs
- 24" (610 mm) minimum 26 AWG UL listed wires
- Slot width 0.20" (5.08 mm)
- Slot Depth 0.635" (16.13 mm)



### Description:

The **OPB916** series of Photologic® photo integrated circuit switches provide optimum flexibility. Each switch consists of an infrared Light Emitting Diode (LED) and a Photologic® photo integrated circuit, mounted in an opaque housing with clear windows for dust protection. The deep slot allows for a longer reach of the optical path from the 0.650" (16.5 mm) mounting plane. Internal apertures are 0.010" x .060" (.25 mm x 1.52 mm) for the Photologic's "S" side and 0.05" x 0.06" (1.27 mm x 1.52 mm) for the LED "E" side.

Devices in this series exhibit stable performance over supply voltages ranging from 4.5 V to 16.0 V, and may be specified as buffered or inverted with an internal 10 kΩ pull-up resistor or open collector output. Devices are TTL/LSTTL compatible and can drive up to 10 TTL loads.

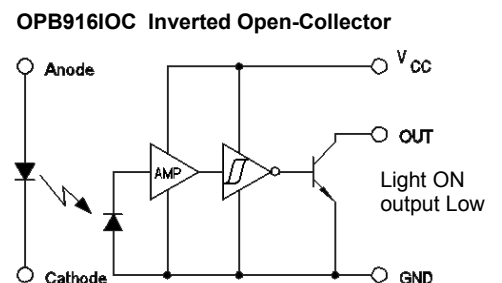
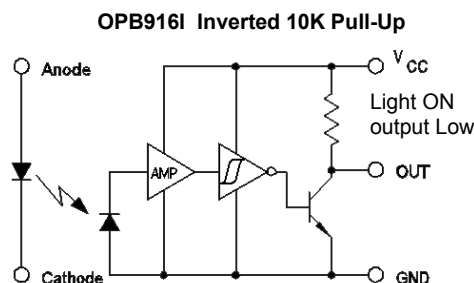
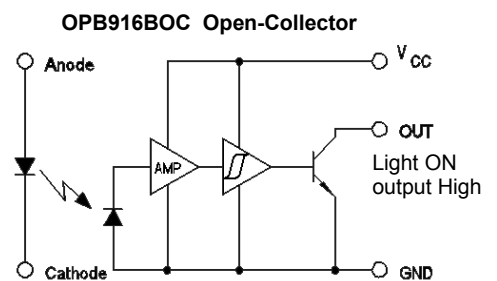
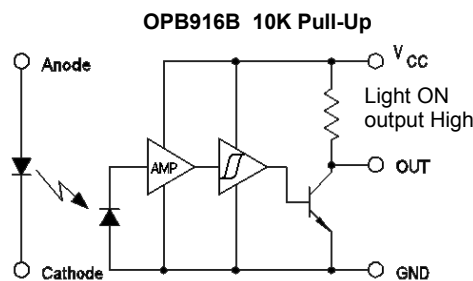
Custom electrical, wire or cabling are available. Contact your local representative or OPTEK for more information.

### Applications:

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

Ordering Information					
Part Number	LED Peak Wavelength	Sensor Photologic®	Slot Width / Depth	Aperture Emitter / Sensor	Lead Length / Wire
OPB916BZ	880 nm	10K Pull-Up	0.200" / 0.635"	0.05" / 0.01"	24" / 26 AWG Wire
OPB916IZ		Inv-10K Pull-Up			
OPB916BOCZ		Open-Collector			

Color	Description
Red	Anode
Black	Cathode
White	Vcc
Blue	Output
Green	Ground

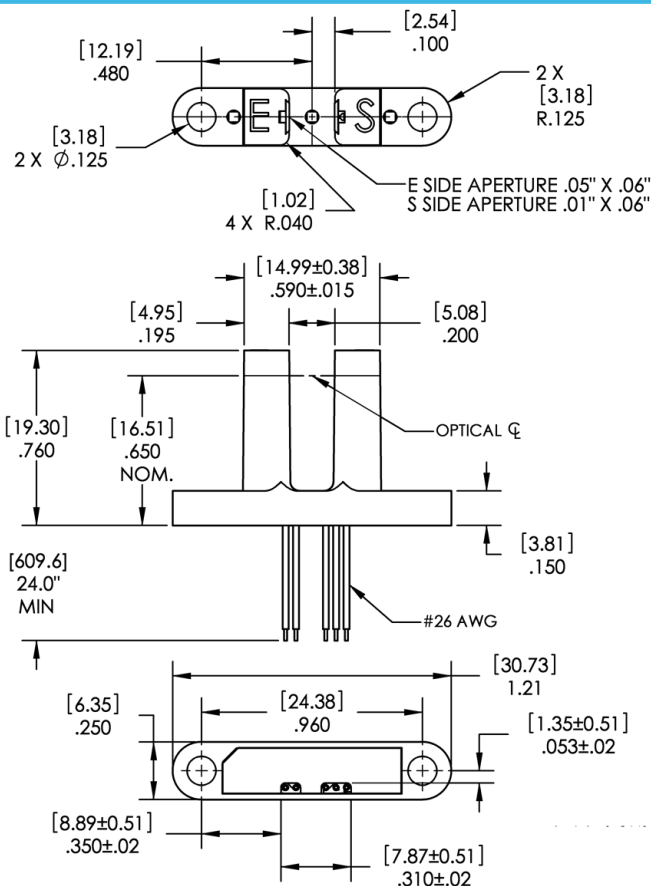


### General Note

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# Photologic® Slotted Optical Switch



Color-Pin #	Description
Red	Anode
Black	Cathode
Green	Ground
Blue	Output
White	V <sub>CC</sub>

Tolerance ±0.010 [0.254]

DIMENSIONS ARE IN: [ MILLIMETERS ]  
[ INCHES ]

Absolute Maximum Ratings (T <sub>A</sub> = 25° C unless otherwise noted)	
Storage & Operating Temperature Range	-40°C to +80°C
<b>Input Infrared LED</b>	
Diode Reverse DC Voltage	2 V
Input Diode Power Dissipation <sup>(2)</sup>	75 mW
Forward DC Current	50 mA
<b>Output Photologic®</b>	
Supply Voltage, V <sub>CC</sub> (not to exceed 3 seconds)	18 V
Voltage at Output Lead (Open Collector Output)	30 V
Output Photologic® Power Dissipation <sup>(3)</sup>	90 mW

Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (2) Derate linearly 1.67 mW/°C above 25°.
- (3) Derate linearly 2.67 mW/°C above 25°.
- (4) Normal application would be with light source blocked, simulated by I<sub>F</sub> = 0 mA.
- (5) All parameters tested using pulse technique.

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Electrical Characteristics (T <sub>A</sub> = 25° C unless otherwise noted)						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>Input Diode</b>						
V <sub>F</sub>	Forward Voltage	-	1.3	1.8	V	I <sub>F</sub> = 20 mA
I <sub>R</sub>	Reverse Current	-	-	100	μA	V <sub>R</sub> = 2 V, T <sub>A</sub> = 25° C
<b>Output Photologic® Sensor</b>						
V <sub>CC</sub>	Operating DC Supply Voltage	4.5	-	16	V	-
I <sub>CCL</sub>	Low Level Supply Current: Buffered with 10k pull-up <sup>(1)</sup> Buffered Open-Collector Output <sup>(1)</sup>	-	-	7	mA	V <sub>CC</sub> = 16 V, I <sub>F</sub> = 0 mA, No Output Load
	Inverted with 10k pull-up: Inverted Open-Collector Output	-	-	7	mA	V <sub>CC</sub> = 16 V, I <sub>F</sub> = 10 mA, No Output Load
I <sub>CCH</sub>	High Level Supply Current: Buffered with 10k pull-up Buffered Open-Collector Output	-	-	6	mA	V <sub>CC</sub> = 16 V, I <sub>F</sub> = 10 mA, No Output Load
	Inverted with 10k pull-up: Inverted Open-Collector Output <sup>(1)</sup>	-	-	6	mA	V <sub>CC</sub> = 16 V, I <sub>F</sub> = 0 mA, No Output Load
V <sub>OL</sub>	Low Level Output Voltage: Buffered with 10k pull-up Buffered Open-Collector Output	-	-	0.4	V	V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = 16 mA, I <sub>F</sub> = 0 mA
	Inverted with 10k pull-up: Inverted Open-Collector Output	-	-	0.4	V	V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = 16 mA, I <sub>F</sub> = 10 mA
V <sub>OH</sub>	High Level Output Voltage: Buffered with 10k pull-up	V <sub>CC</sub> - 2.0	-	-	V	V <sub>CC</sub> = 4.5 V to 16 V, I <sub>F</sub> = 10 mA, I <sub>OH</sub> = 100 μA
	Inverted with 10k pull-up:	V <sub>CC</sub> - 2.0	-	-	V	V <sub>CC</sub> = 4.5 V to 16 V, I <sub>F</sub> = 0 mA,
I <sub>OH</sub>	High Level Output Current: Buffered with 10k pull-up Buffered Open-Collector Output	-	1.0	10	μA	V <sub>CC</sub> = 4.5 V, I <sub>F</sub> = 10 mA, V <sub>OH</sub> = 30 V
	Inverted with 10k pull-up: Inverted Open-Collector Output <sup>(1)</sup>	-	1.0	10	μA	V <sub>CC</sub> = 4.5 V, I <sub>F</sub> = 0 mA, V <sub>OH</sub> = 30 V

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**Electrical Characteristics** ( $T_A = 25^\circ \text{C}$  unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>Output Photologic® Sensor</b>						
$I_{F(+)}$	LED Positive-Going Threshold Current Buffered with 10k pull-up Inverted with 10k pull-up	-	5	10	mA	$V_{CC} = 5 \text{ V}$ , No Output Load
	Buffered Open-Collector Output Inverted Open-Collector Output <sup>(1)</sup>	-	5	10	mA	$V_{CC} = 4.5 \text{ V}$ , $I_{OL} = 16 \text{ mA}$
$I_{F(+)} / I_{F(-)}$	Hysteresis	-	1.5	-	-	$V_{CC} = 5 \text{ V}$
$t_r, t_f$	Rise Time, Fall Time	-	50	-	ns	$V_{CC} = 5 \text{ V}$ , $I_F = 0$ or $10 \text{ mA}$ ,
$t_{PLH}, t_{PHL}$	Propagation Delay	-	3	-	$\mu\text{s}$	$R_L = 300 \Omega$ to $5 \text{ V}$ , $C_L = 50 \text{ pF}$

**Notes:**

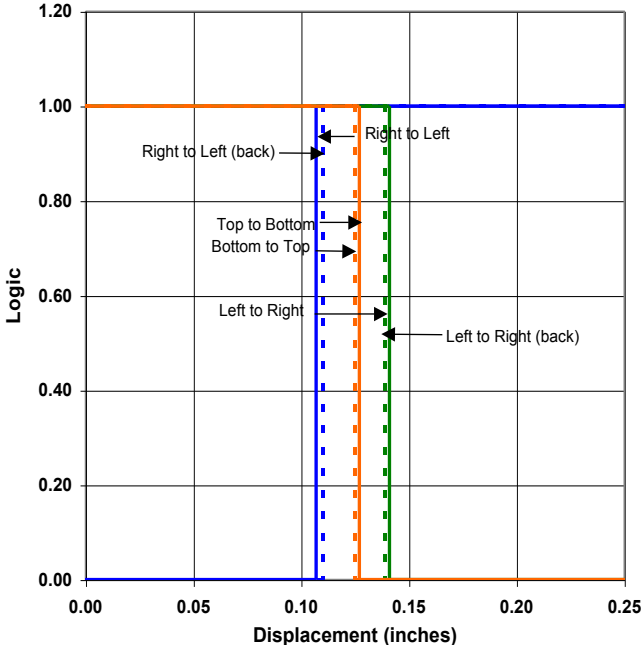
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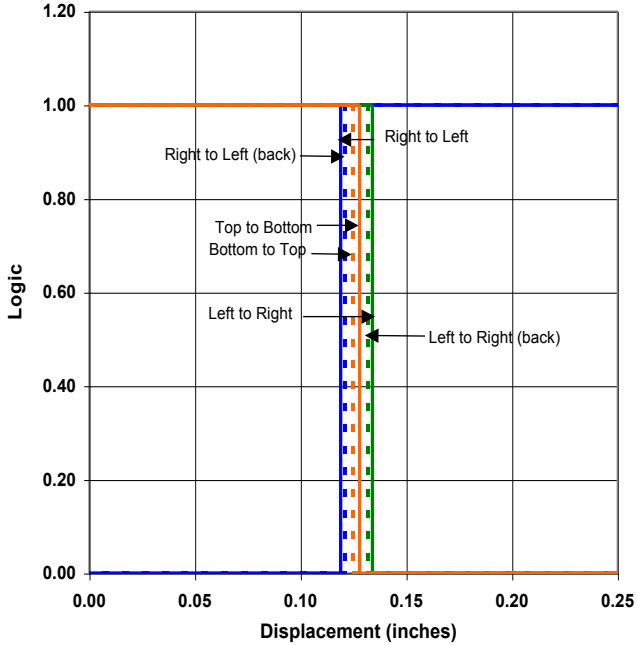
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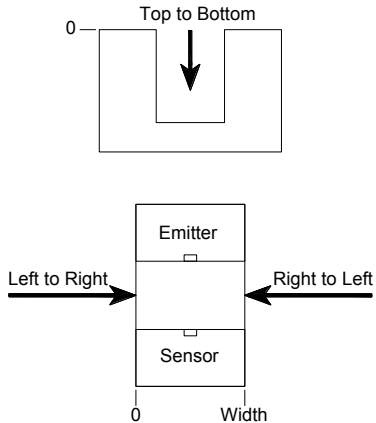
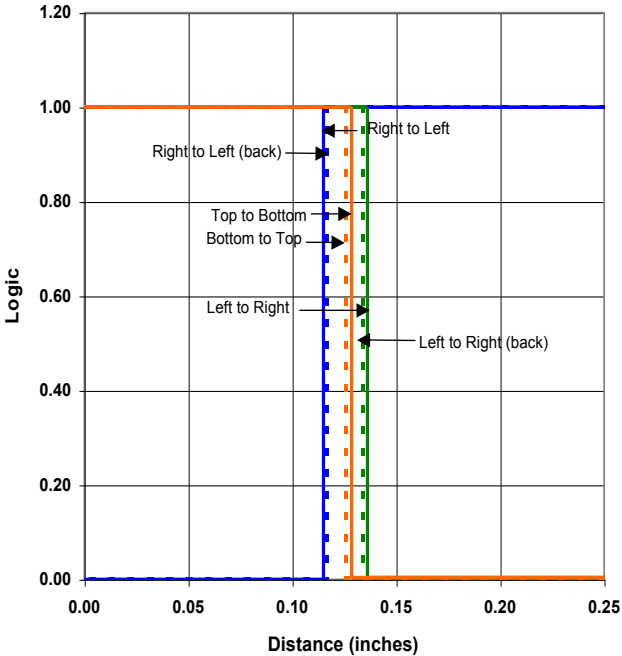
**OPB916B - Flag Next to Emitter**



**OPB916B - Flag Next to Sensor**



**OPB916B - Flag in Middle of Slot**



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Issue	Change Description	Approval	Date
A	Initial Release, new format	Steve Coble	12/13/06
A.1	Fixed Ordering Table page 1	Bob Procsal	1/25/08
A.2	Fixed nomenclature on schematics page 1	Mark Miller	8/04/08
A.3	Changed mechanical drawing, Absolute Max Ratings and some Electrical Characteristics	Mark Miller	08/07/08
B	Transferred to the new TT Electronics template	L. Timpa	10/6/16

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