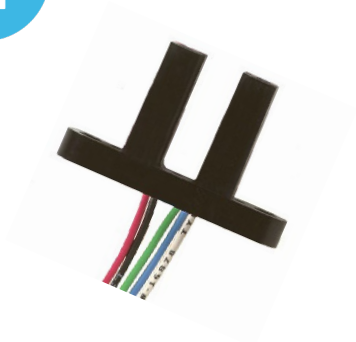
Photologic® Slotted Optical Switch

OPB916 Series



Features:

- Low power consumption
- Data rates to 200 kBaud
- Choice of two logic states and two electrical outputs
- 24” (610 mm) minimum #26 AWG UL rated wires
- Slot width 0.20” (5.08 mm)
- Slot Depth 0.635” (16.13 mm)

Description:

The **OPB916** series of Photologic® integrated circuit switches provide optimum flexibility. Each switch consists of an infrared Light Emitting Diode (LED) and a Photologic® 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 a buffered 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.

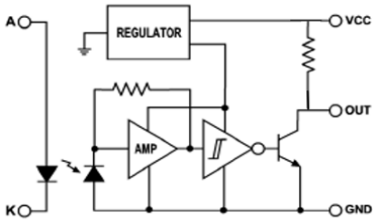
Applications:

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

Ordering Information

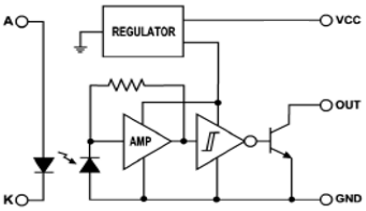
Part Number	LED Peak Wavelength	Sensor Photologic®	Slot Width / Depth	Aperture Emitter /Sensor	Lead Length / Wire
OPB916BZ	890 nm	10 K Pull-Up	0.200” / 0.635”	0.05" / 0.01"	24" / #26 AWG UL Rated Wire
OPB916IZ		Inv-10 K Pull-Up			
OPB916BOCZ		Open-Collector			

OPB916BZ 10 K Pull-Up

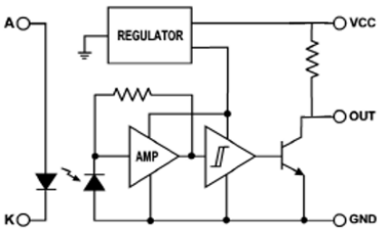


Light ON
Output High

OPB916BOCZ Open-Collector



OPB916IZ Inverted 10 K Pull-Up



Light ON
Output Low

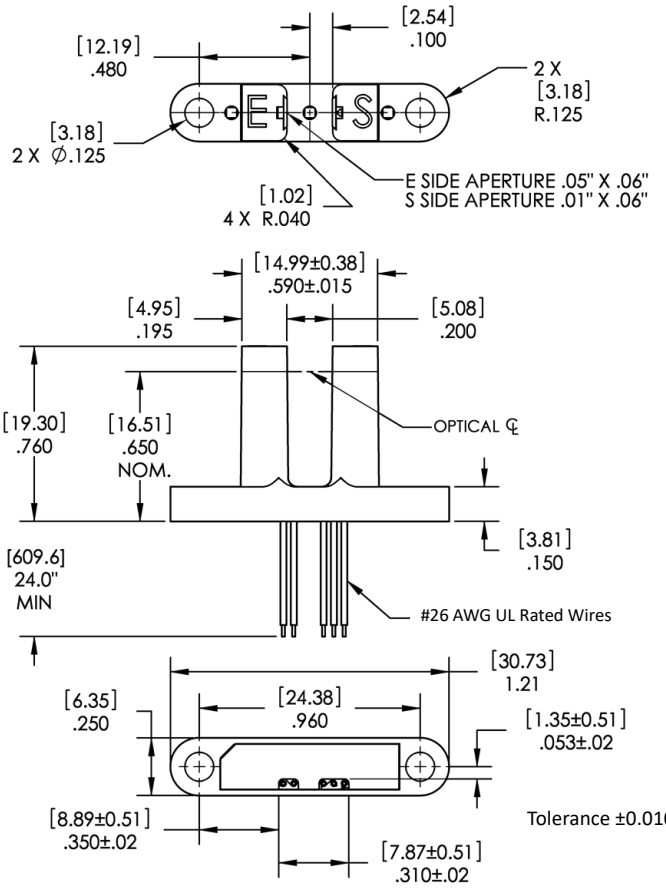
RoHS

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Packaging



Color-Pin #	Description
Red	Anode
Black	Cathode
Green	Ground
Blue	Output
White	V_{CC}

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Electrical Specifications

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Storage & Operating Temperature Range	-40° C to +80° C
Input Infrared LED	
Diode Reverse DC Voltage	2 V
Input Diode Power Dissipation (2)	100 mW
Forward DC Current	50 mA
Output Photologic ®	
Supply Voltage, V_{CC} (not to exceed 3 seconds)	18 V
Voltage at Output Lead (Open Collector Output)	30 V
Output Photologic® Power Dissipation (3)	200 mW

Notes:

(1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
(2) Derate linearly 1.45 mW/° C above 25° C.
(3) Derate linearly 2.67 mW/° C above 25° C.
(4) Normal application would be with light source blocked, simulated by I_F = 0 mA.
(5) All parameters tested using pulse technique.

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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	1.3	1.8	V	I_F = 20 mA
I_R	Reverse Current	-	-	100	µA	V_R = 2 V, T_A = 25° C
Output Photologic ® Sensor						
V_{CC}	Operating DC Supply Voltage	4.5	-	16	V	-
I_{CCL} (1)	Low Level Supply Current: Buffered with 10 k pull-up Buffered Open-Collector Output	-	-	7	mA	V_{CC} = 16 V, I_F = 0 mA, No Output Load
	Inverted with 10 k pull-up:					V_{CC} = 16 V, I_F = 10 mA, No Output Load
I_{CCH}	High Level Supply Current: Buffered with 10 k pull-up Buffered Open-Collector Output	-	-	6	mA	V_{CC} = 16 V, I_F = 10 mA, No Output Load
	Inverted with 10 k pull-up:					V_{CC} = 16 V, I_F = 0 mA, No Output Load
V_{OL}	Low Level Output Voltage: Buffered with 10 k pull-up Buffered Open-Collector Output	-	-	0.4	V	V_{CC} = 4.5 V, I_{OL} = 16 mA, I_F = 0 mA
	Inverted with 10 k pull-up:					V_{CC} = 4.5 V, I_{OL} = 16 mA, I_F = 10 mA
I_{OH}	High Level Output Current: Buffered with 10 k pull-up Buffered Open-Collector Output	-	1.0	10	µA	V_{CC} = 4.5 V, I_F = 10 mA, V_{OH} = 30 V
	Inverted with 10 k pull-up:					V_{CC} = 4.5 V, V_{OH} = 30 V, I_F = 0 mA
$I_{F(+)}$	LED Positive-Going Threshold Current Buffered with 10 k pull-up Inverted with 10 k pull-up	-	5	10	mA	V_{CC} = 5 V, No Output Load
	Buffered Open-Collector Output					V_{CC} = 4.5 V, I_{OL} = 16 mA
$I_{F(+)}/I_{F(-)}$	Hysteresis	-	1.5	-	-	V_{CC} = 5 V
t_r, t_f	Rise Time, Fall Time	-	50	-	ns	V_{CC} = 5 V, I_F = 0 or 10 mA,
t_{PLH}, t_{PHL}	Propagation Delay	-	3	-	µs	R_L = 300 Ω to 5 V, C_L = 50 pF

Notes:
(1) Normal application would be with light source blocked, simulated by I_F = 0 mA.
(2) All parameters tested using pulse technique.

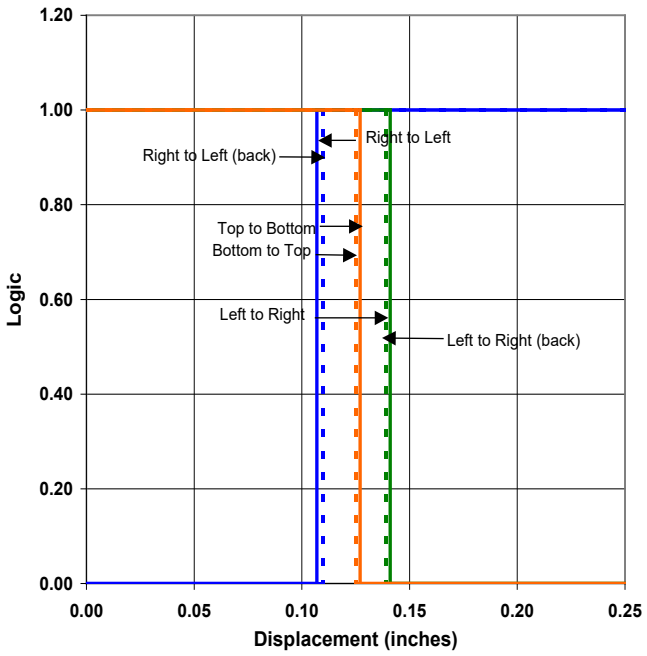
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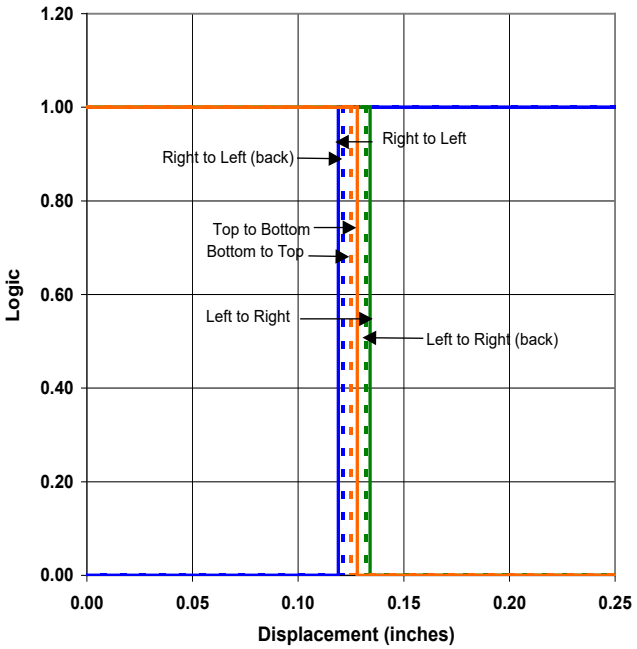
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Typical Performance

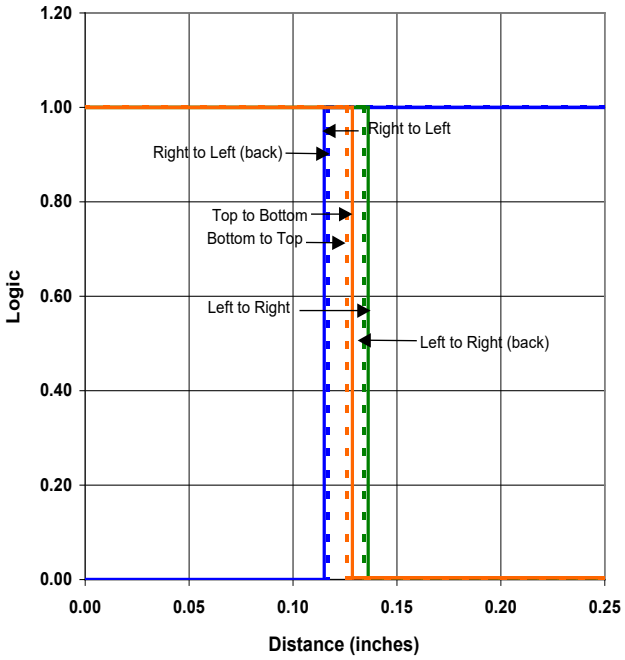
OPB916B - Flag Next to Emitter

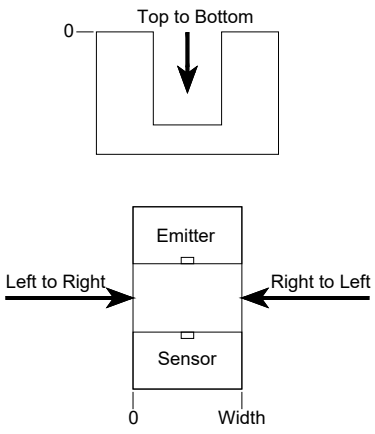


OPB916B - Flag Next to Sensor



OPB916B - Flag in Middle of Slot





General Note

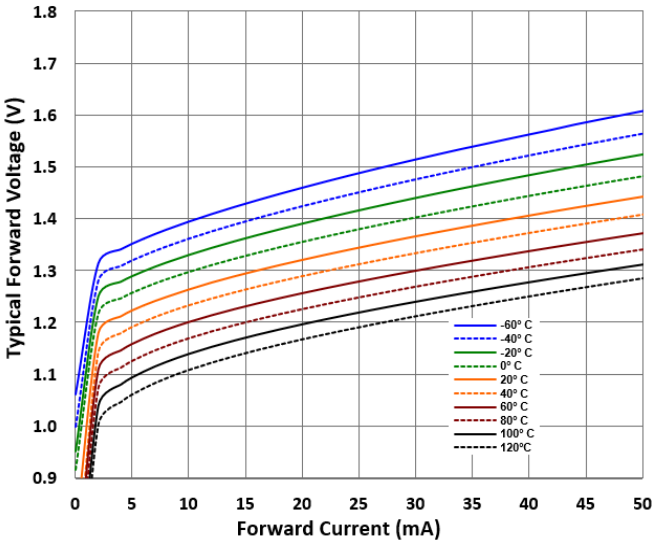
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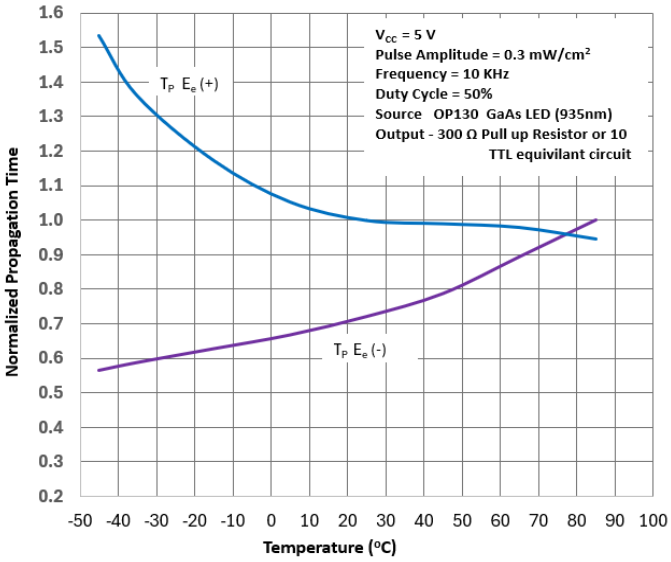
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Typical Performance

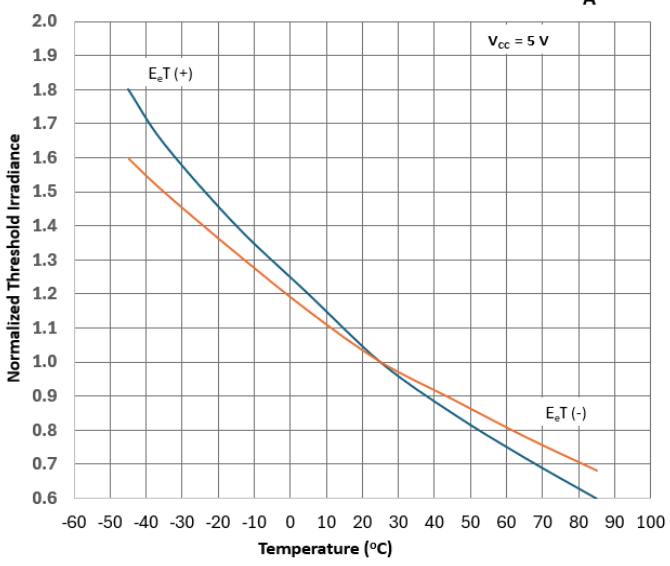
LED Forward Voltage vs I_F vs Temperature



Propagation Time vs Temperature



Normalized Threshold Irradiance vs T_A



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