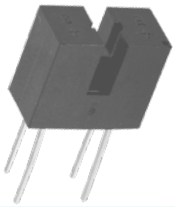
Slotted Optical Switch

OPB847, OPB848



Features:

- Non-contact switching
- Apertured for high resolution

Description:

The **OPB847** and **OPB848** consist of an Infrared (890 nm) Light Emitting Diode (LED) and an NPN silicon Phototransistor, mounted in a low-cost plastic housing on opposite sides of a 0.100 inch (2.540 mm) wide slot. Both device types have a .025 inch (0.635 mm) by .060 inch (1.524 mm) aperture in front of the phototransistor for high resolution positioning sensing. The device is designed to switch electrical states when an opaque object is passed through the slot.

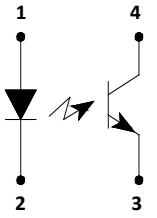
For application information, refer to Application Bulletins 248 and 213.

Contact your local representative or OPTEK for more information.

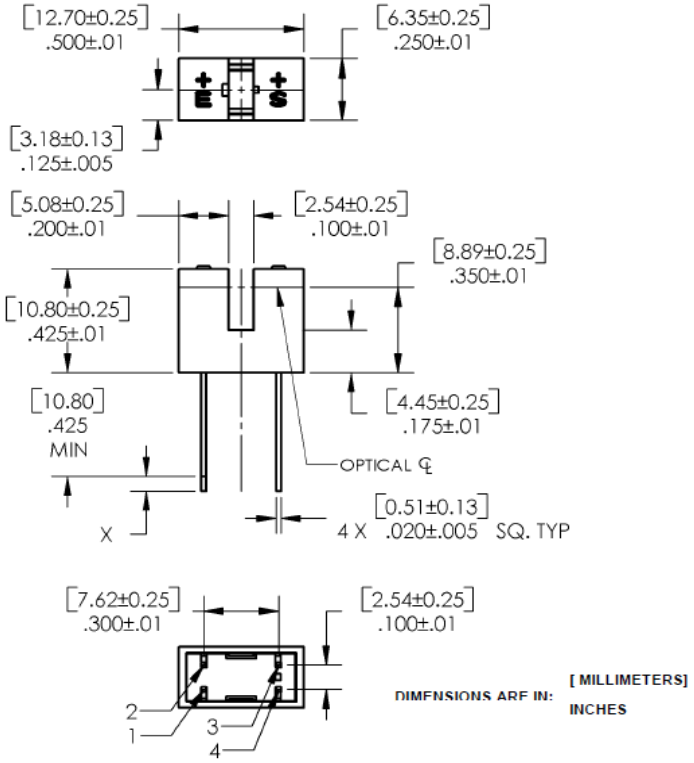
Applications:

- Non-contact interruptive object sensing
- Assembly line automation
- Machine automation
- Equipment security
- Machine safety

Part Number	LED Peak Wavelength	Sensor	Slot Width / Depth	Aperture Emitter /Sensor	Lead Length / Spacing
OPB847	890 nm	Transistor	0.100" / 0.250"	0.025" / 0.025"	0.425" / 0.300"
OPB848					



Pin #	Description
1	Anode
2	Cathode
3	Emitter
4	Collector



RoHS

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Electrical Specifications

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

Operating and Storage Temperature Range	-40° C to +85° C
Lead Soldering Temperature [1/16 inch (1.6 mm) from the case for 5 sec. with soldering iron] (1, 3)	240° C
Input Diode	
Forward DC Current	50 mA
Reverse Voltage	2.0 V
Power Dissipation (2)	100 mW
Output Phototransistor	
Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	7 V
Power Dissipation (2)	100 mW

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F (4)	Forward Voltage	1.15	1.35	1.70	V	I_F = 20 mA
		1.20	1.55	1.90		I_F = 20 mA, T_A = -55° C
		1.10	1.20	1.60		I_F = 20 mA, T_A = 100° C
I_R	Reverse Current	-	0.10	100	µA	V_R = 2 V
Output Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30	110	-	V	I_C = 100 µA, I_F = 0
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	10	-	V	I_E = 100 µA, I_F = 0
I_{CEO}	Collector-Emitter Dark Current	-	0.20	100	nA	V_{CE} = 10 V, I_F = 0
		-	10	100	µA	V_{CE} = 10 V, I_F = 0, T_A = 100° C

Notes:
(1) Duration can be extended to 10 seconds maximum when flow soldering.
(2) Derate linearly 1.33 mW/° C above 25° C.
(3) Methanol and isopropanol are recommended as cleaning agents.
(4) Measurement is taken during the last 500 µs of a single 1.0 ms test pulse. Heating due to increased pulse rate or pulse width can cause change in measurement results.

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Electrical Specifications

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Combined						
$I_{C(ON)}$ (1)	On-State Collector Current OPB847 OPB848	 4.0 1.0	-	-	mA	V_{CE} = 10 V, I_F = 20 mA
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage OPB847 OPB848	 - -	 0.30 0.30	 0.40 0.40	V	I_C = 2 mA, I_F = 20 mA I_C = 500 µA, I_F = 20 mA
t_r	Output Rise Time OPB847 OPB848	 - -	 12 8	 20 15	µs	V_{CC} = 10 V, I_F = 20 mA, R_L = 1000Ω
t_f	Output Fall Time OPB847 OPB848	 - -	 12 8	 20 15		

Notes:

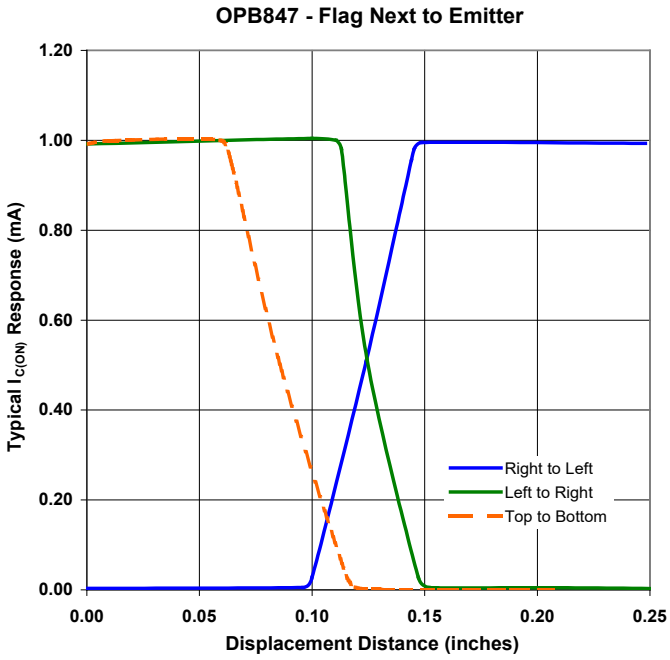
(1) Measurement is taken during the last 500 µs of a single 1.0 ms test pulse. Heating due to increased pulse rate or pulse width can cause change in measurement results.

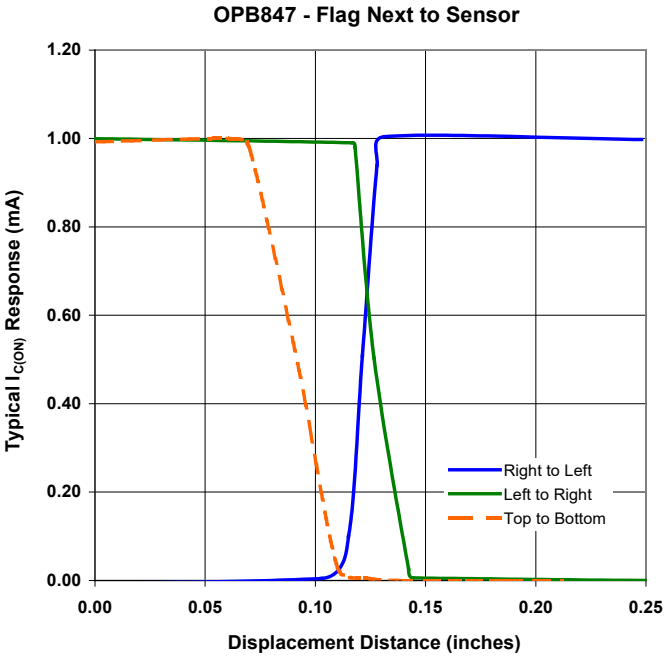
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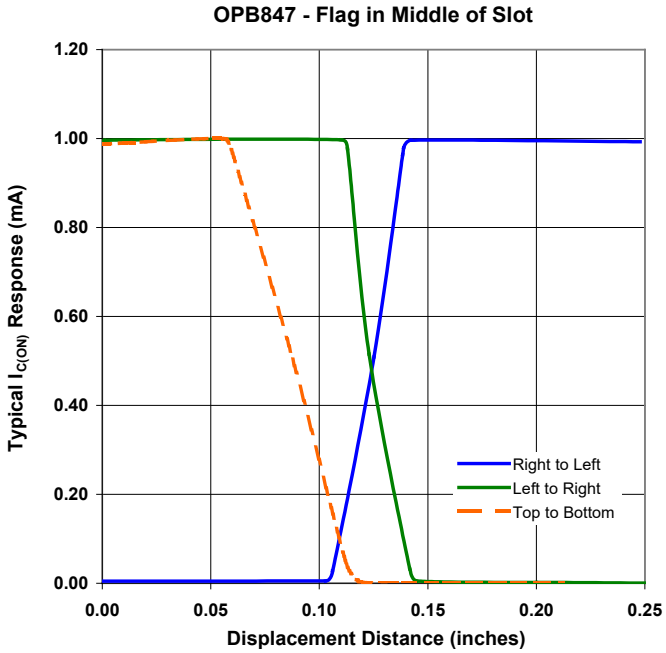
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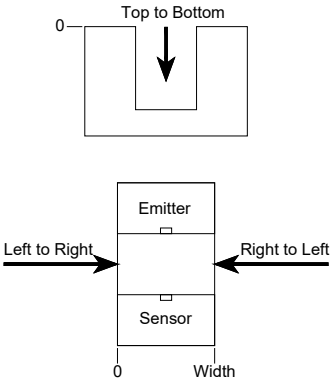
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Typical Performance









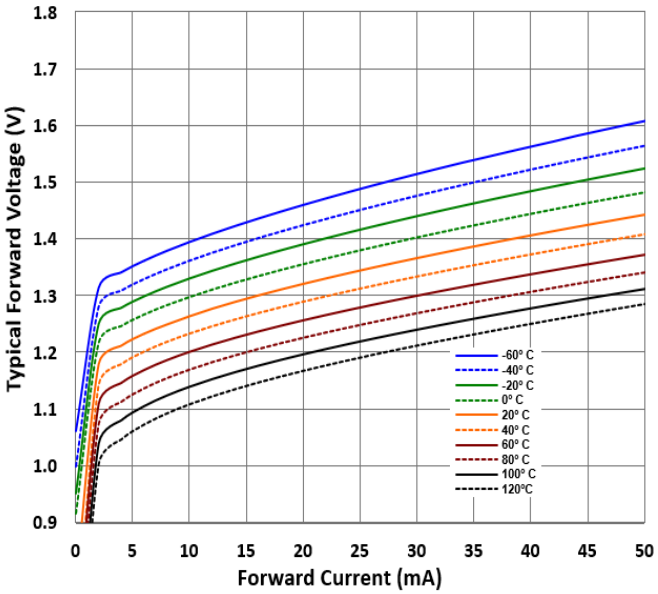
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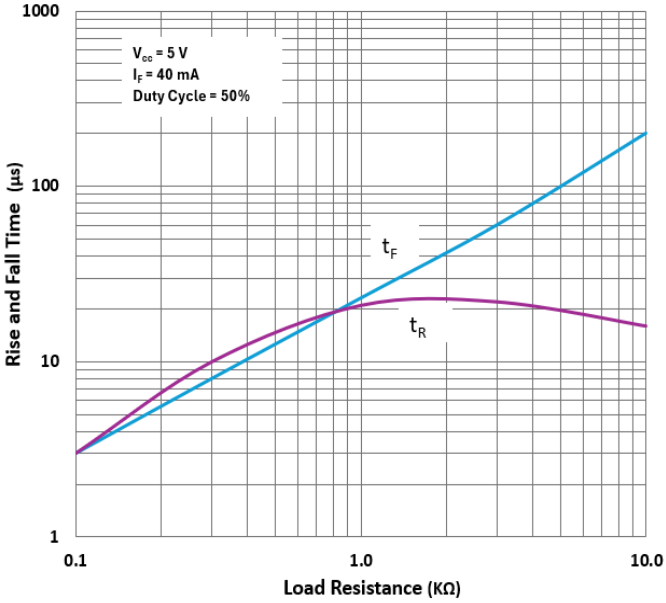
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Typical Performance

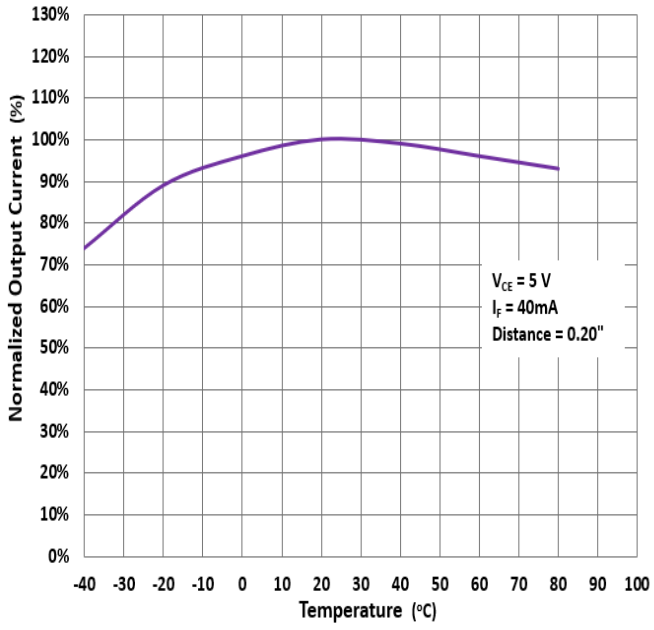
LED Forward Voltage vs I_F vs Temperature



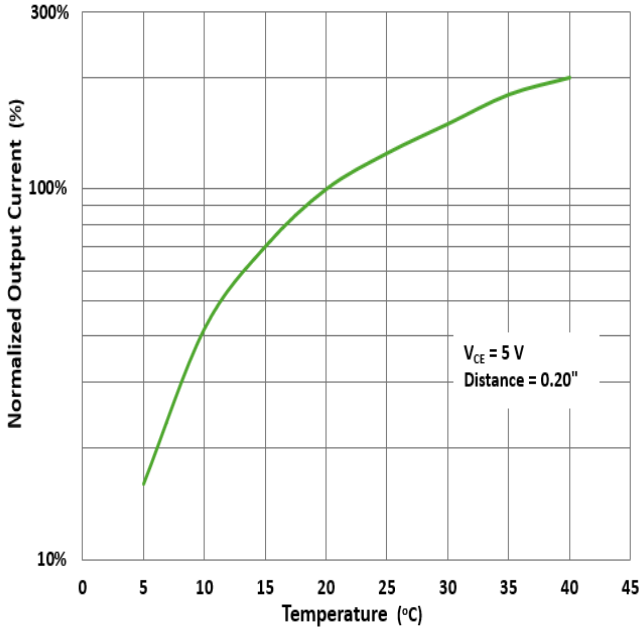
Transistor Output - Rise and Fall Time



Collector Current vs Temperature



Output Current vs LED Current



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