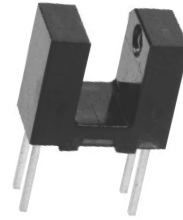


Slotted Optical Switch

OPB610, OPB620, OPB621



Features:

- Non-contact switching
- Printed circuit board mounting
- Enhanced signal to noise ratio
- PIN photodiode sensor for high speed (OPB621)
- Lead centers: 0.275: (OPB61_) / 0.320" (OPB62_)

Description:

The **OPB610** and **OPB620** slotted optical switches consist of an infrared emitting diode and an NPN silicon phototransistor with an enhanced low current roll-off to improve contrast ratio and immunity to background irradiance.

The **OPB621** slotted optical switch consists of an infrared emitting diode and a PIN photodiode with a polysulfone housing that is opaque to visible light, but transmissive to infrared. The low t_r/t_f of the PIN photodiode is ideal for high-speed operation. The sensitivity to ambient radiation is minimized.

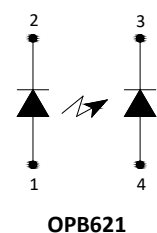
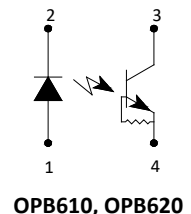
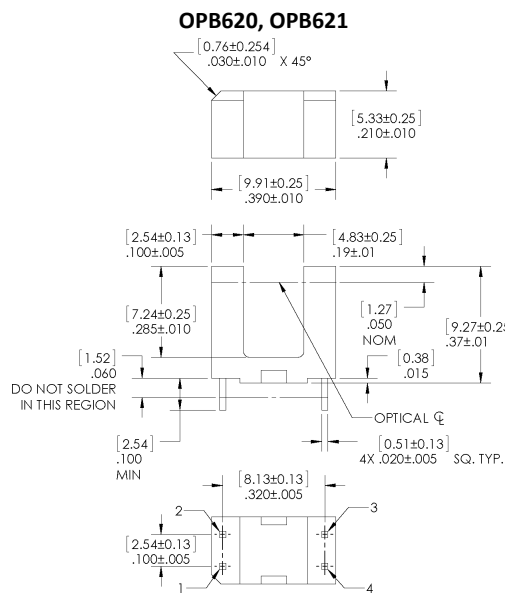
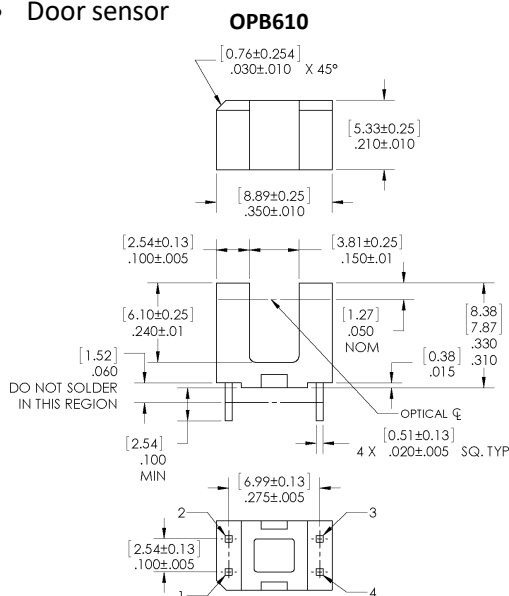
For application information, See Application Bulletins 248 and 213.

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

Applications:

- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor

Ordering Information					
Part Number	LED Peak Wavelength	Sensor	Slot Width / Depth	Aperture Emitter / Sensor	Lead Length / Spacing
OPB610	890 nm	Rbe Transistor	0.150" / 0.240"	0.06" / 0.06"	0.100" / 0.275"
OPB620		Rbe Transistor	0.190" / 0.285"		0.100" / 0.320"
OPB621		Diode			



RoHS

DIMENSIONS ARE IN:

[MILLIMETERS]

INCHES

Pin #	LED	Pin #	Transistor / Diode
1	Anode	4	Emitter / Anode
2	Cathode	3	Collector / Cathode

General Note

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Electrical Specifications

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

Storage and Operating Temperature Range	-40° C to +100° C
Lead Soldering Temperature [1/16 inch (1.6 mm) from the case for 5 sec. with soldering iron] ⁽¹⁾	260° C
Input Diode	
Forward DC Current	50 mA
Peak Forward Current (1 µs pulse width, 300 pps)	3 A
Reverse DC Voltage	3 V
Power Dissipation ⁽²⁾	100 mW
Output Photodiode (OPB621)	
Reverse Breakdown Voltage	60 V
Power Dissipation ⁽²⁾	100 mW
Output Phototransistor (OPB610, OPB620)	
Collector-Emitter Voltage	24 V
Emitter-Reverse Current	10 mA
Collector DC Current	30 mA
Power Dissipation ⁽³⁾	200 mW

Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering. A maximum of 20 grams force may be applied to leads when soldering.
- (2) Derate linearly 1.07 mW/° C above 25° C.
- (3) Derate linearly 2.4 mW/° C above 25° C.
- (4) Plastic body is soluble in chlorinated hydrocarbons and ketones. It is recommended that a trial exposure to flux & cleaning chemicals is performed to ensure sensor is not damaged.

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Electrical Specifications

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage	1.0	-	1.6	V	$I_F = 10 \text{ mA}$
	OPB610, OPB620	1.15	-	1.45	V	$I_F = 10 \text{ mA}$
I_R	Reverse Current	-	-	100	μA	$V_R = 3 \text{ V}$
Output Phototransistor (OPB610, OPB620)						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	24	-	-	V	$I_C = 100 \mu\text{A}$
BV_{ECO}	Emitter-Collector Breakdown Voltage	0.4	-	-	V	$I_{CE} = 100 \mu\text{A}$
I_{CEO}	Collector-Emitter Dark Current	-	-	100	nA	$V_{CE} = 5 \text{ V}$
Output Photodiode (OPB621)						
I_D	Dark Current	-	-	65	nA	$V_R = 30 \text{ V}, E_E = 0 \text{ mW}$
$V_{(BR)R}$	Reverse Breakdown Voltage	60	-	-	V	$I_R = 100 \mu\text{A}, E_E = 0 \text{ mW}$
V_F	Forward Voltage	-	-	1.0	V	$I_F = 1 \text{ mA}, E_E = 0 \text{ mW}$
Combined						
V_{SAT}	Collector-Emitter Saturation Voltage	-	-	0.4	V	$I_F = 5 \text{ mA}, I_C = 100 \mu\text{A}$
$I_{C(ON)}$	On-State Collector/Diode Current	1	-	-	mA	$I_F = 5 \text{ mA}, V_{CE} = 5 \text{ V}$ (gap unblocked)
	OPB610, OPB620	9	-	90	μA	$V_R = 5 \text{ V}, I_F = 20 \text{ mA}$ (gap unblocked)
	OPB621					

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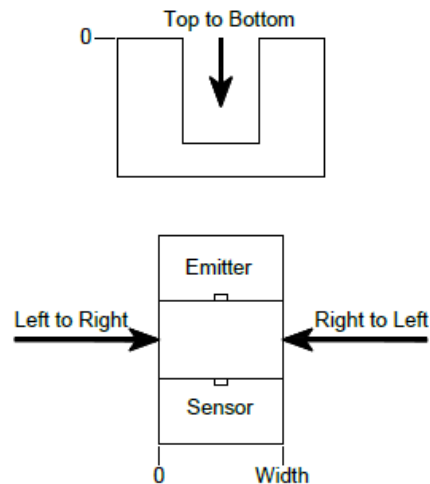
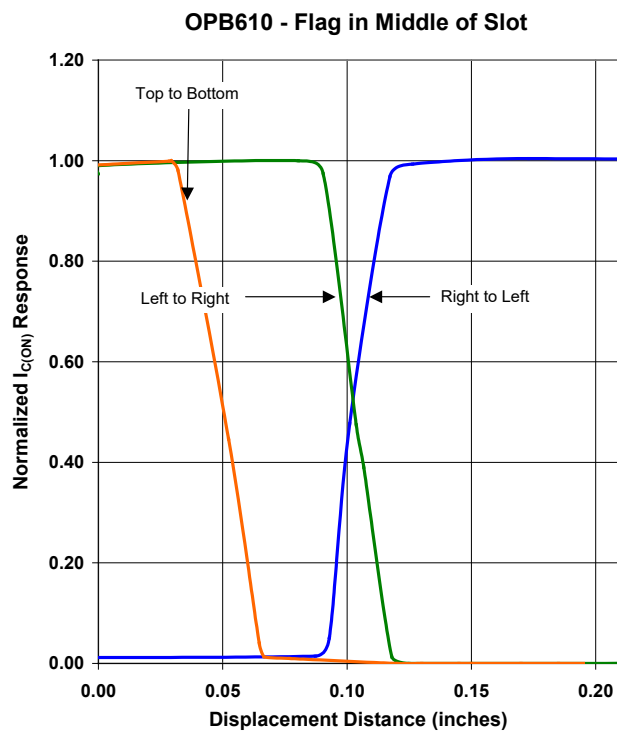
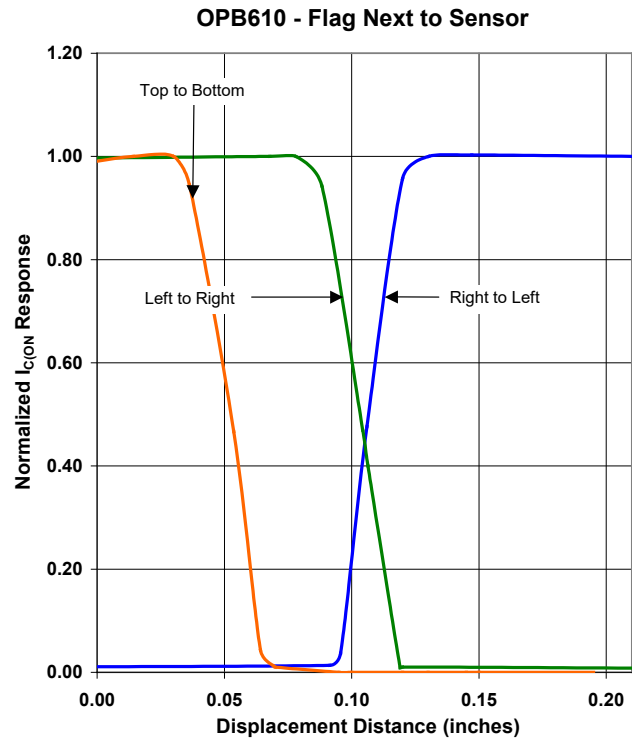
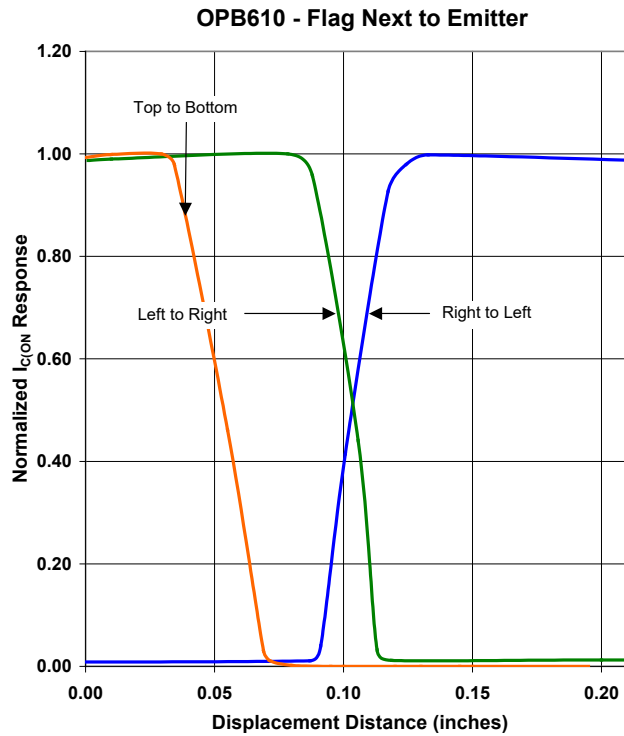
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Slotted Optical Switch

OPB610, OPB620, OPB621



Typical Performance



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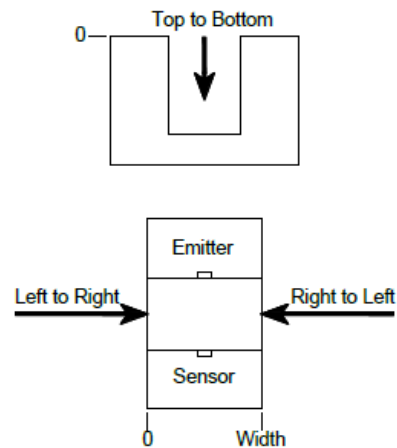
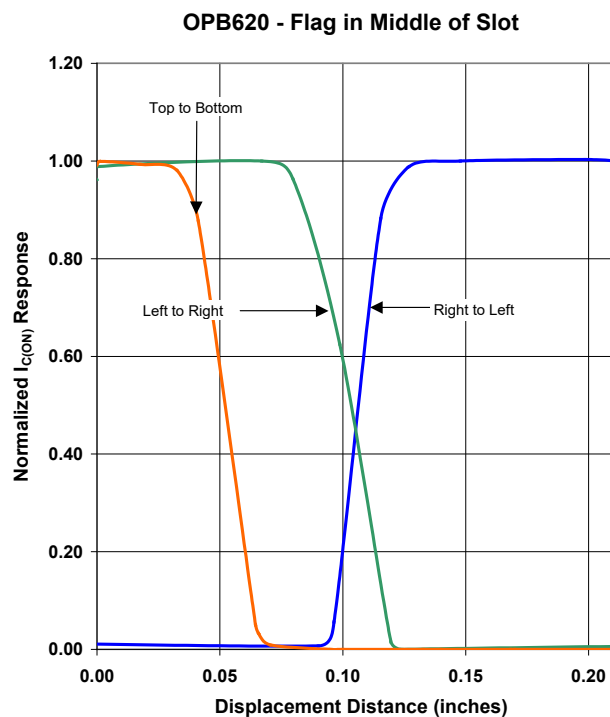
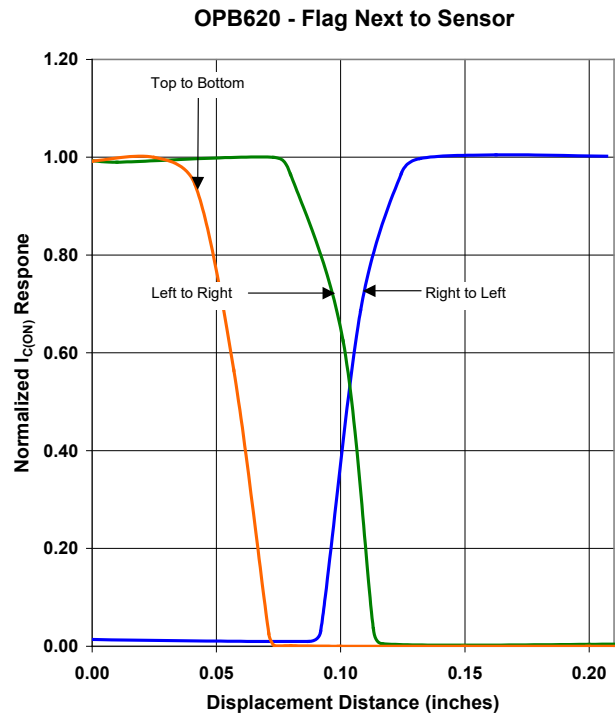
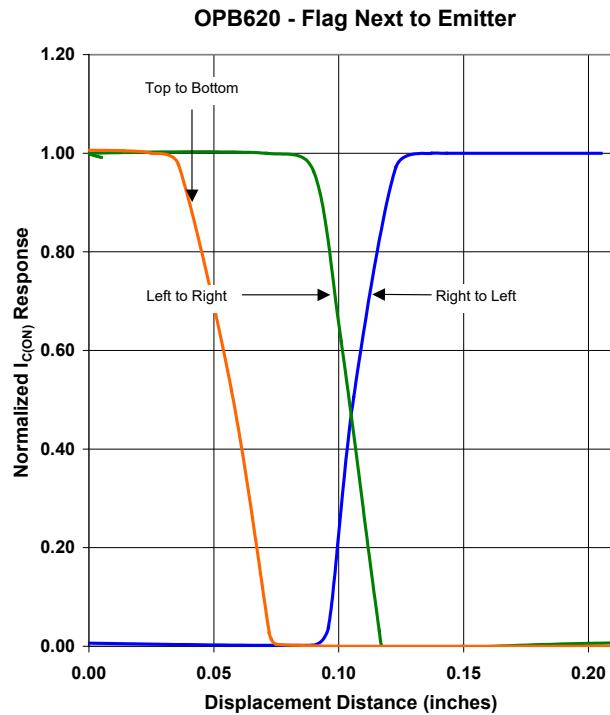
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Slotted Optical Switch

OPB610, OPB620, OPB621



Typical Performance



General Note

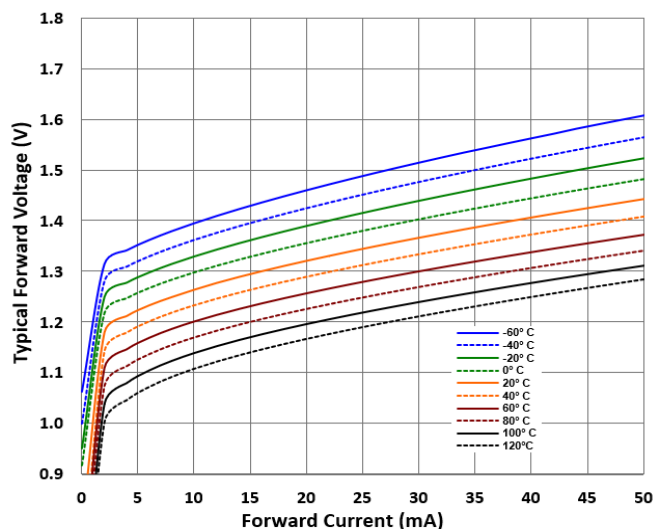
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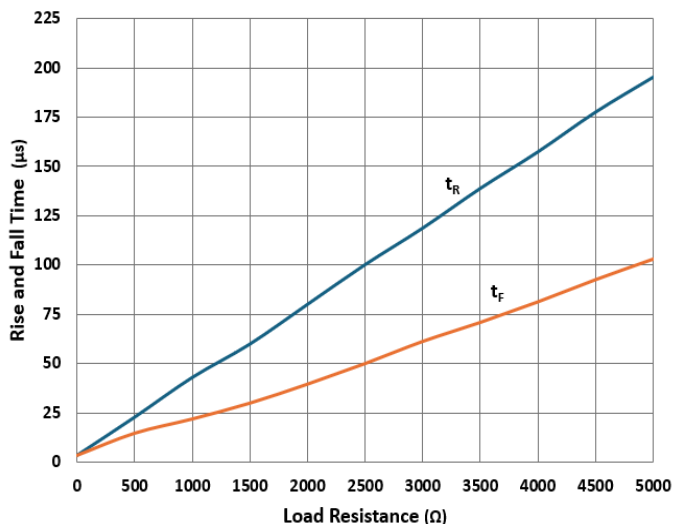
Typical Performance

OPB610 OPB620

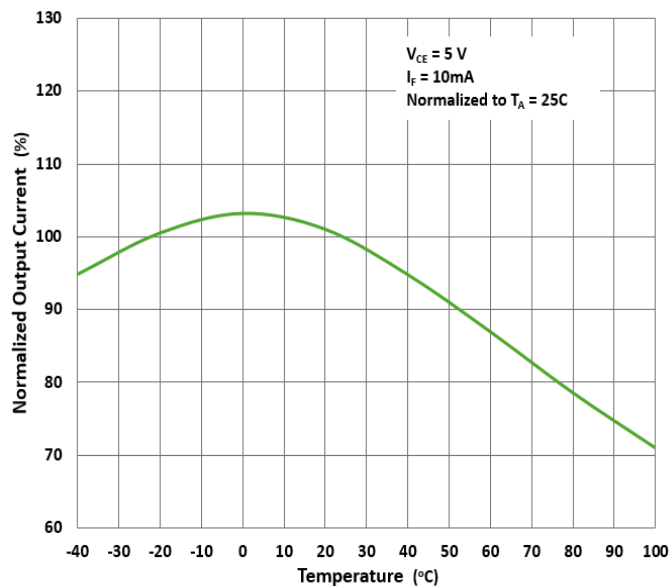
LED Forward Voltage vs I_F vs Temperature



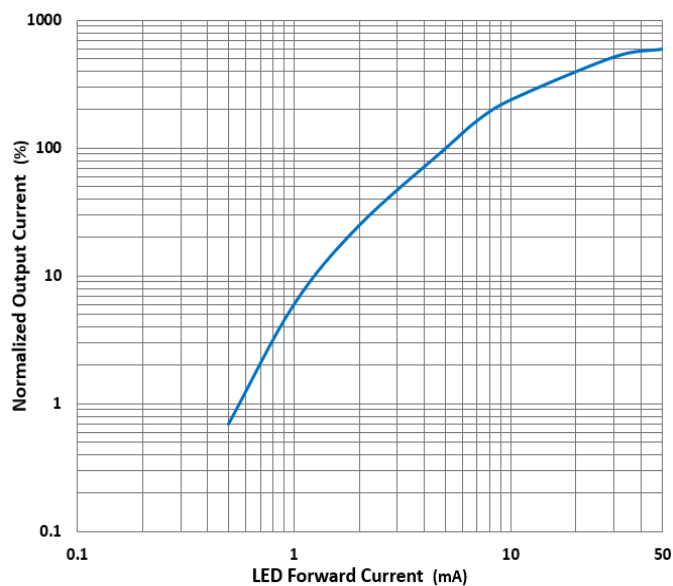
Rise and Fall Time vs Load Resistance



Output Current vs Temperature



Output Current vs LED Current



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