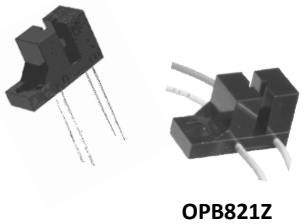
Slotted Optical Switch

OPB820S, OPB821Z, OPB821S_Z

Features:

- Non-contact switching
- Four standard aperture sizes for high resolution
- Low profile
- 0.080” (2.03 mm) wide, 0.250” (8.89 mm) deep slot
- Choice of PCBoard or wire mountings

OPB820S



OPB821Z

Description:

Each OPB820S and OPB821Z device consists of an infrared emitting diode (LED, 890 nm center wavelength) and a NPN silicon phototransistor mounted in a low-cost black plastic housing on opposite sides of an 0.080” (2.03 mm) wide slot. Each device in this series has a 0.040” (1.02 mm) wide aperture located in front of the infrared diode. Phototransistor switching occurs when an opaque object passes through the slot.

Devices are offered with 0.275” (6.96 mm) lead spacing for PCBoard mounting (OPB820S) or 24” (609 mm) 26 AWG wire leads (OPB821Z).

Applications:

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

Ordering Information					
Part Number	**LED Peak Wavelength**	**Sensor**	**Slot Width / Depth**	**Aperture Emitter/Sensor**	**Lead Length / Spacing**
OPB820 Obsolete	890 nm	Transistor	0.080" / 0.255”	0.04"/ 0.04"	0.425" / 0.275"
OPB820S10				0.04"/ 0.01"	
OPB820S5				0.04"/ 0.005"	
OPB820S3				0.04"/ 0.003"	
OPB821Z				0.040"/ 0.040"	24"/26 AWG Wire
OPB821S10Z				0.040"/ 0.010"	
OPB821S5Z				0.040"/ 0.005"	
OPB821S3Z				0.040"/ 0.003"	

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Electrical Specifications

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

Storage and Operating Temperature	-40° C to +85° C
Lead Soldering Temperature (1/16 inch [1.6 mm] from case for 5 seconds with soldering iron)(1)	260° C
Input Diode	
Continuous Forward Current	50 mA
Peak Forward Current (1 µs pulse width, 300 pps)	1 A
Reverse Voltage	2 V
Power Dissipation(2)	100 mW
Output Phototransistor	
Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5 V
Power Dissipation(2)	100 mW

Notes:
(1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
(2) For OPB820S, derate linearly 1.67 mW/° C above 25° C. For OPB821Z, derate linearly 1.82 mW/° C above 25° C.
(3) Methanol or isopropanol are recommended as cleaning agents. Plastic housing is soluble in chlorinated hydrocarbons and ketones.
(4) All parameters were tested using pulse technique.

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode (See OP245 for additional information)						
V_F	Forward Voltage	-	-	1.7	V	I_F = 20 mA
I_R	Reverse Current	-	-	100	µA	V_R = 2 V
Output Phototransistor (See OP555 for additional information)						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30	-	-	V	I_C = 100 mA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	I_E = 100 µA
I_{CEO}	Collector-Emitter Dark Current	-	-	100	nA	V_{CE} = 10 V, I_F = 0, I_E = 0
Coupled						
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage					
	OPB821Z	-	-	0.4	V	I_C = 250 µA, I_F = 20 mA
	OPB820S3, OPB821S3Z	-	-	0.4	V	I_C = 40 µA, I_F = 20 mA
	OPB820S5, OPB821S5Z	-	-	0.4	V	I_C = 150 µA, I_F = 20 mA
	OPB820S10, OPB821S10Z	-	-	0.4	V	I_C = 250 µA, I_F = 20 mA
$I_{C(ON)}$	On-State Collector Current					
	OPB821Z	500	-	-	µA	V_{CE} = 5 V, I_F = 20 mA
	OPB820S3, OPB821S3Z	60	-	-	µA	V_{CE} = 5 V, I_F = 20 mA
	OPB820S5, OPB821S5Z	300	-	-	µA	V_{CE} = 5 V, I_F = 20 mA
	OPB820S10, OPB821S10Z	400	-	-	µA	V_{CE} = 5 V, I_F = 20 mA

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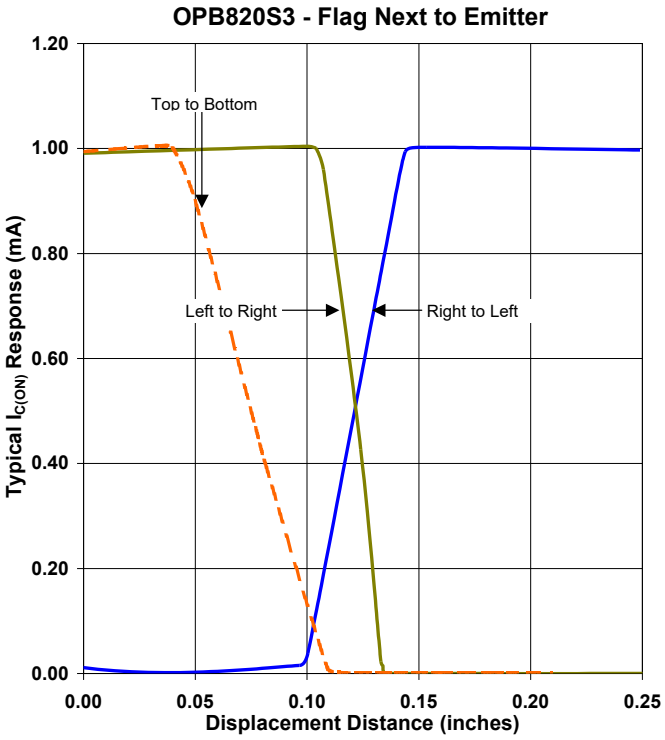
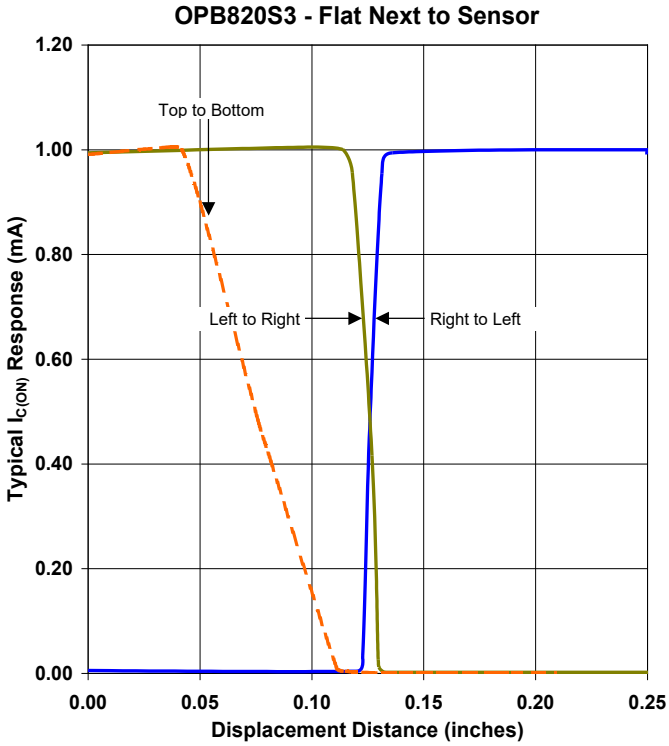
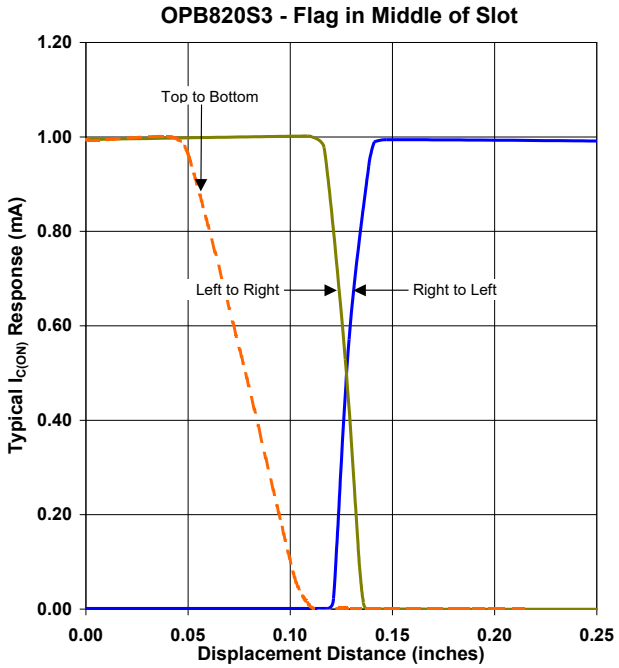
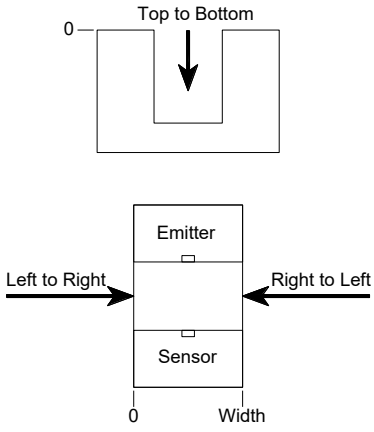
Performance









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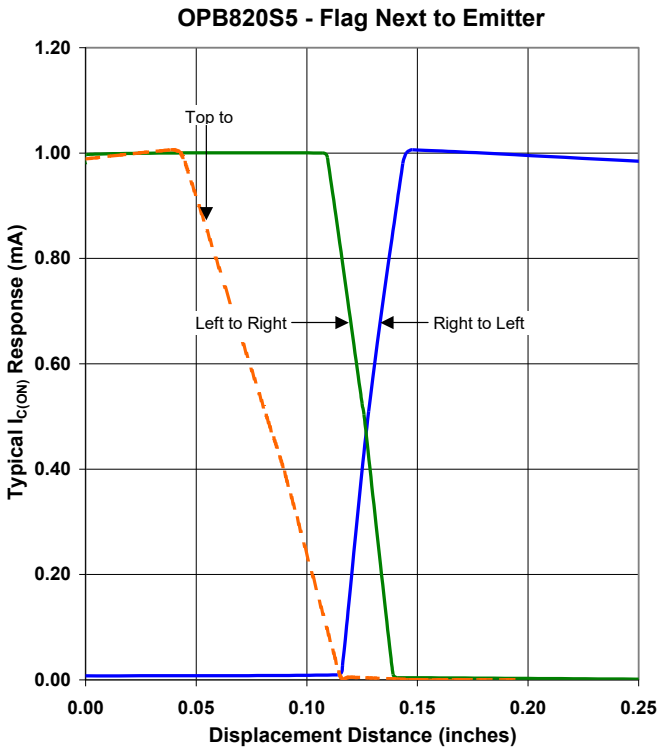

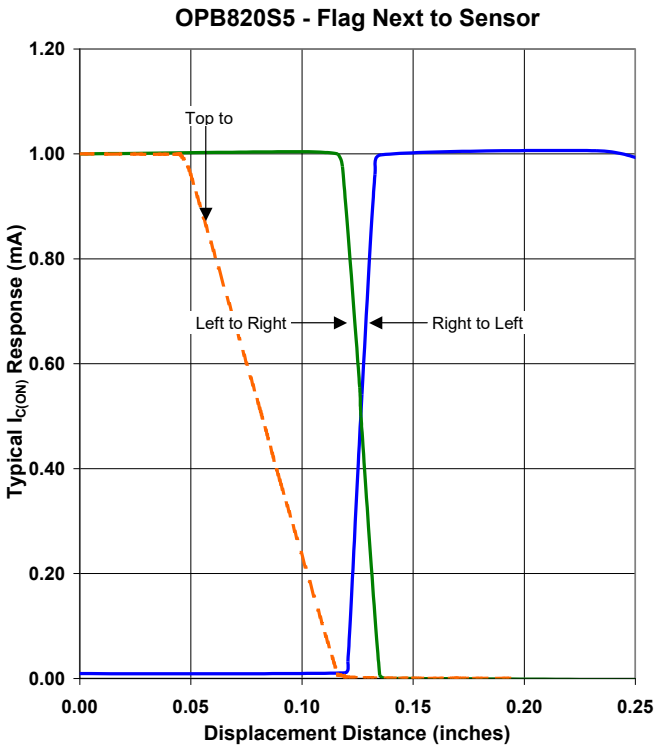

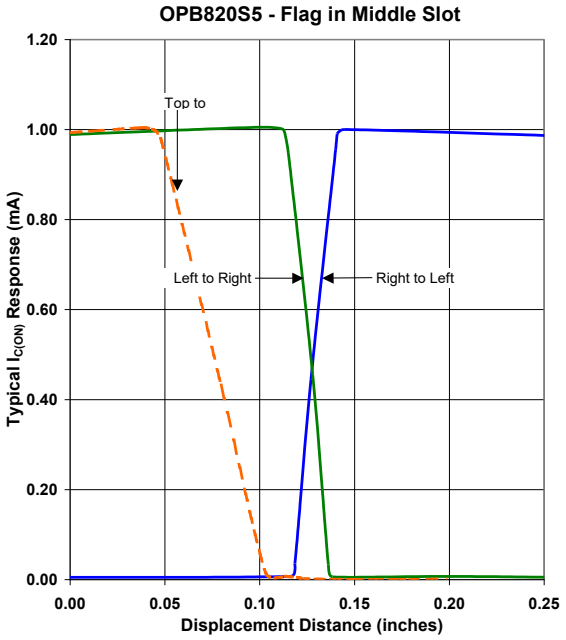

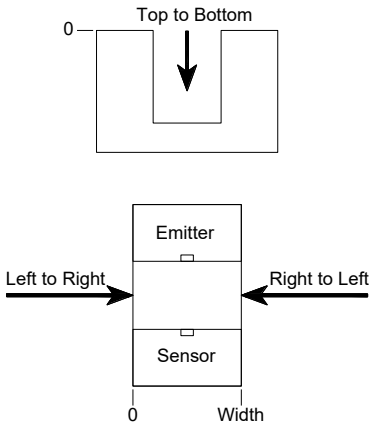

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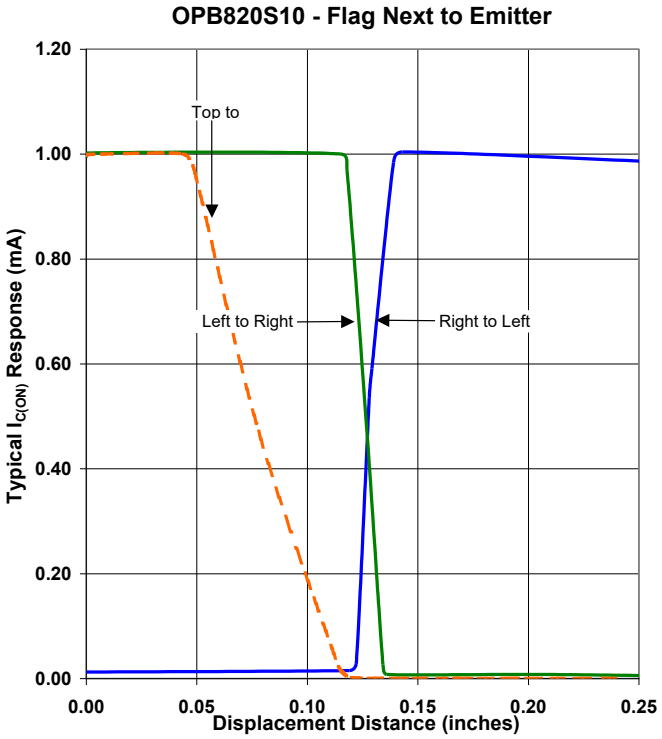

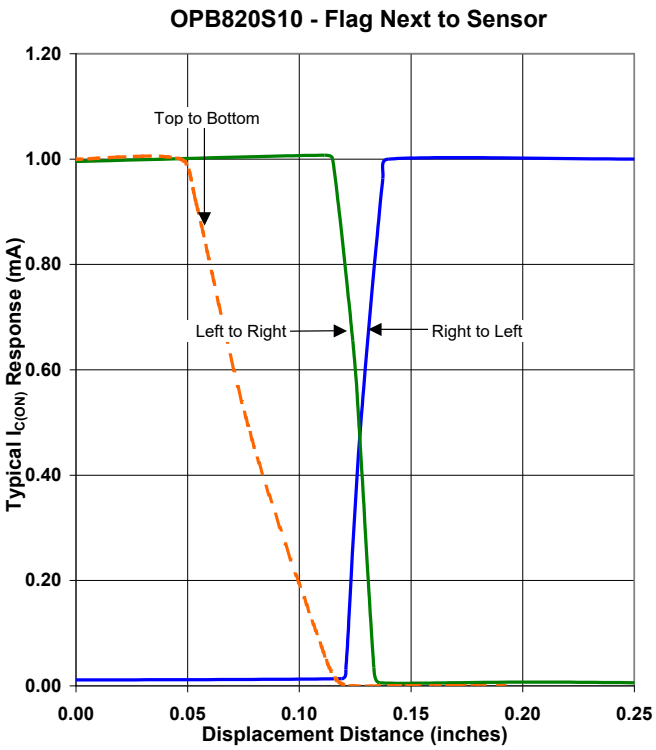

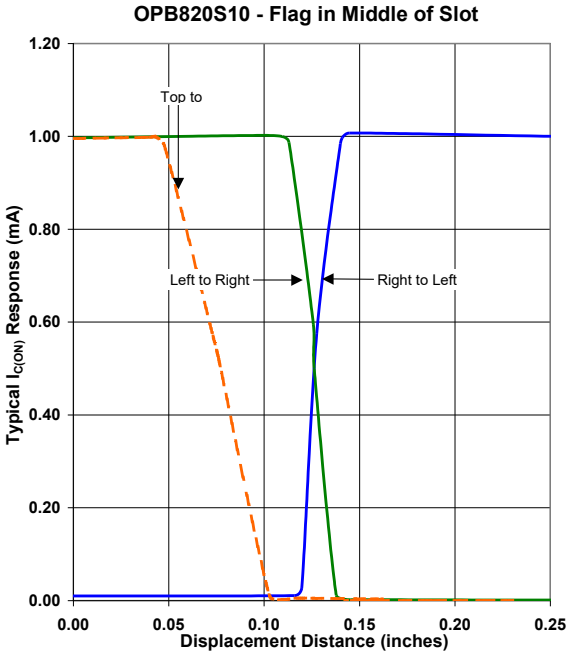

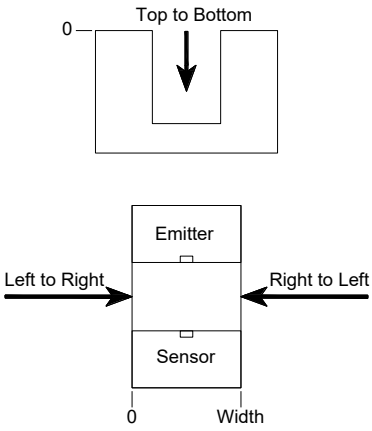

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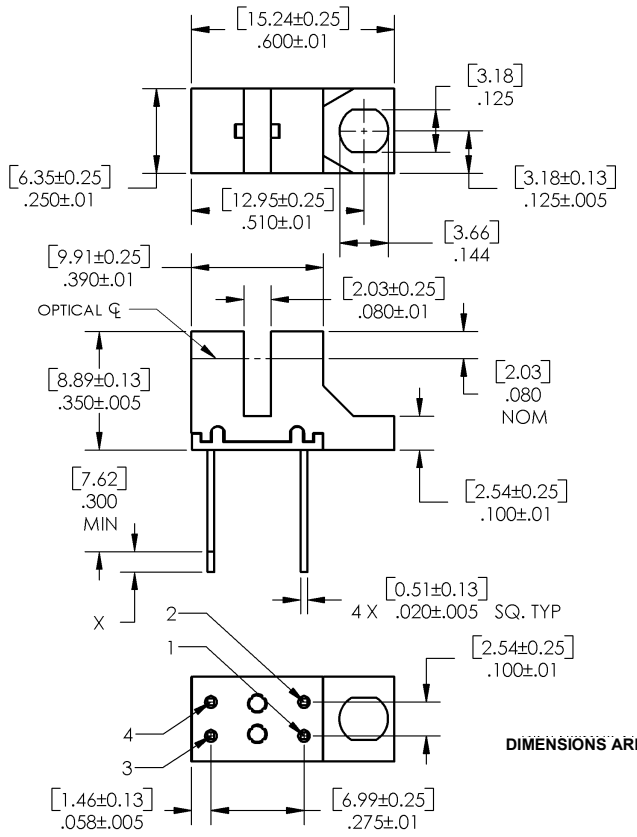
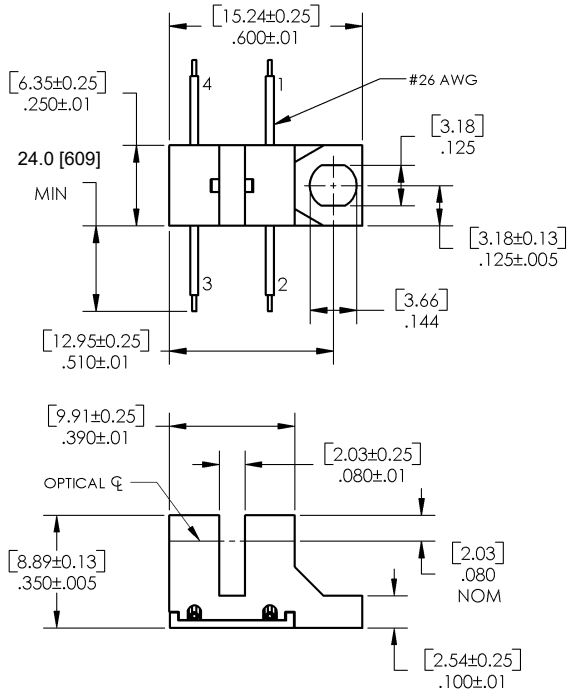
Packaging

Package Drawing
OPB820S Series



Package Drawing
OPB821Z Series



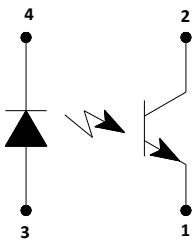
DIMENSIONS ARE IN: [MILLIMETERS]
INCHES

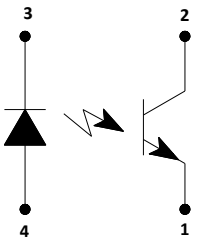
CONTAINS POLYSULFONE

To avoid stress cracking, we suggest using ND Industries' **Vibra-Tite** for thread-locking. **Vibra-Tite** evaporates fast without causing structural failure in OPTEK's molded plastics.

Pin #	Description	Pin #	Description
4	Cathode	2	Collector
3	Anode	1	Emitter

Color/Pin #	Description	Color/Pin #	Description
Green-3	Cathode	White-2	Collector
Orange-4	Anode	Blue-1	Emitter





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