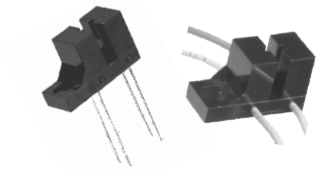
Slotted Optical Switch

OPB820S, OPB821Z, OPB821S_Z

OPB820S



OPB821Z

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 printed circuit board mounting or #26 AWG UL rated wires

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 printed circuit board mounting (OPB820S) or 24” (609 mm) #26 AWG UL rated wire leads (OPB821Z).

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

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

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	890 nm	Transistor	0.080"/ 0.255”	0.040"/ 0.040"	0.425" / 0.275"
OPB820S10				0.040"/ 0.010"	
OPB820S5				0.040"/ 0.005"	
OPB820S3				0.040"/ 0.003"	
OPB821Z				0.040"/ 0.040"	24"/ #26 AWG UL Rated Wire
OPB821S10Z				0.040"/ 0.010"	
OPB821S5Z				0.040"/ 0.005"	
OPB821S3Z				0.040"/ 0.003"	

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.

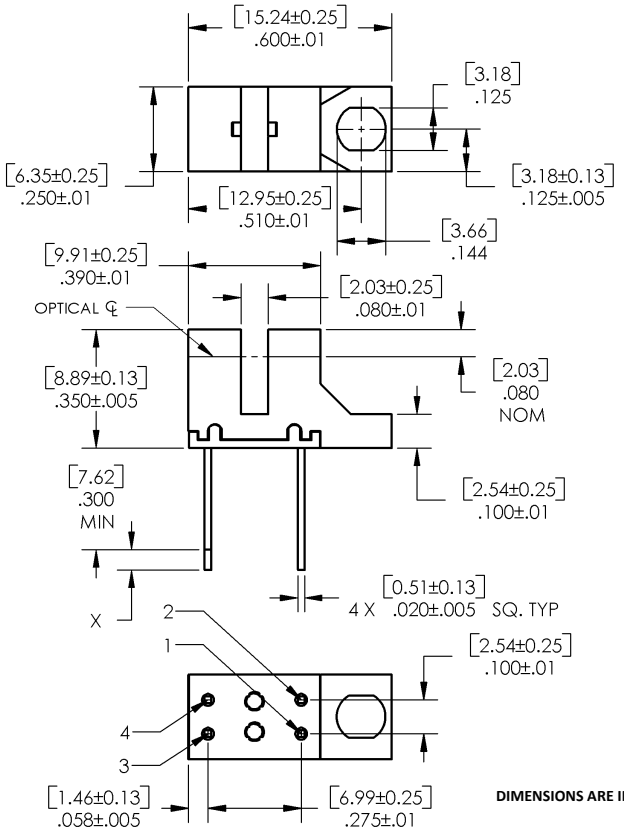
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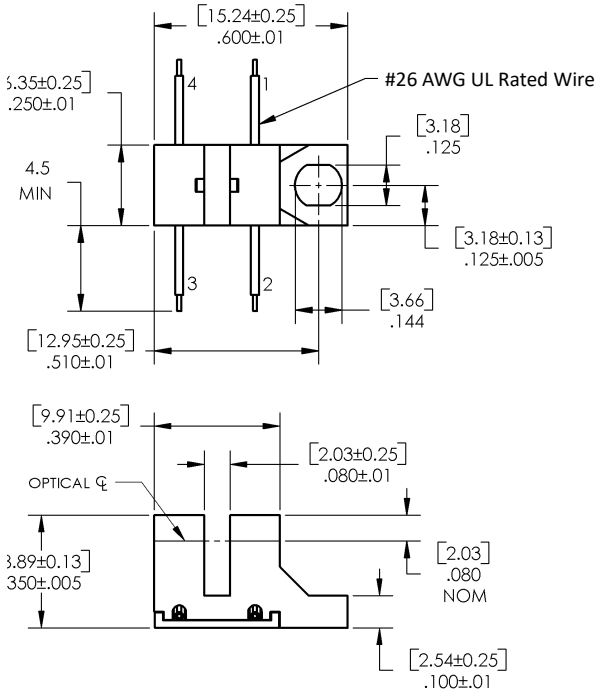
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Packaging

Package Drawing
OPB820S Series



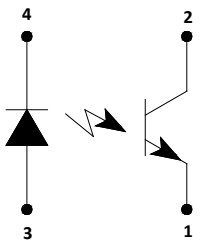
Package Drawing
OPB821Z Series

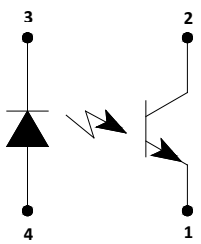


DIMENSIONS ARE IN: **[MILLIMETERS]**
INCHES

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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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, 3)	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 1.33 mW/° C above 25° C. For OPB821Z, derate linearly 1.33 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) (4)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage	1.0	-	1.7	V	I_F = 20 mA
I_R	Reverse Current	-	-	100	µA	V_R = 2 V
Output Phototransistor						
$V_{(BR)CEO}$	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					
	OPB820, 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					
	OPB820, 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

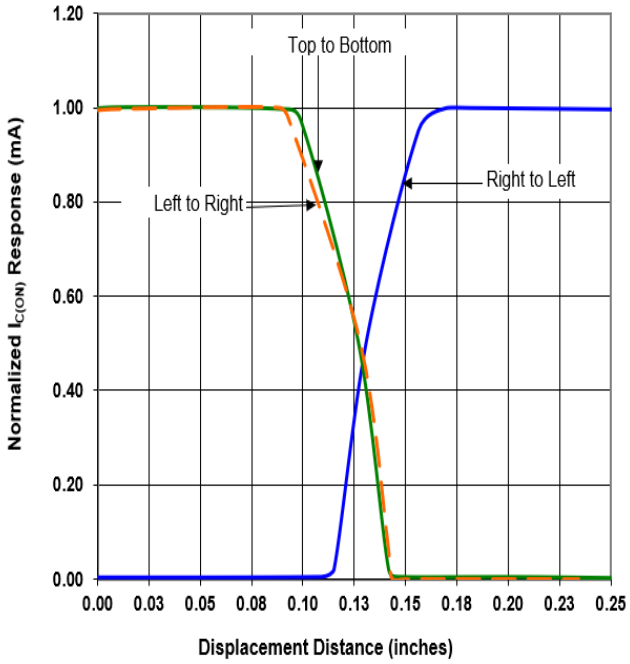
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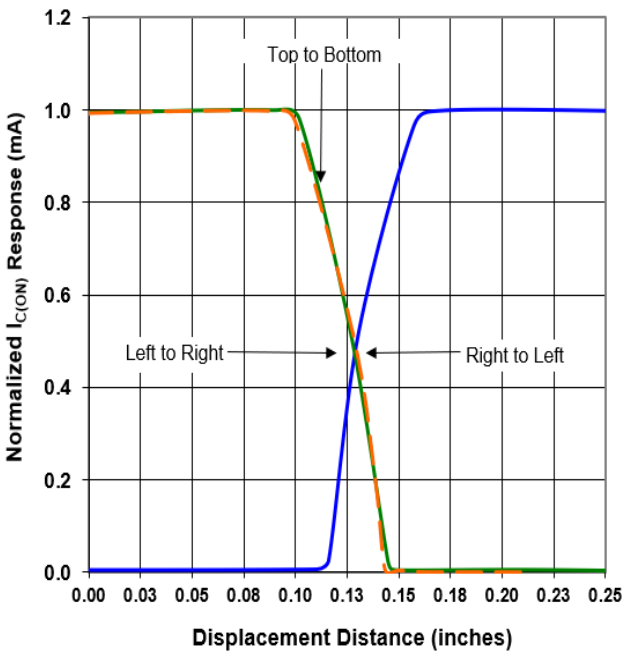
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Typical Performance

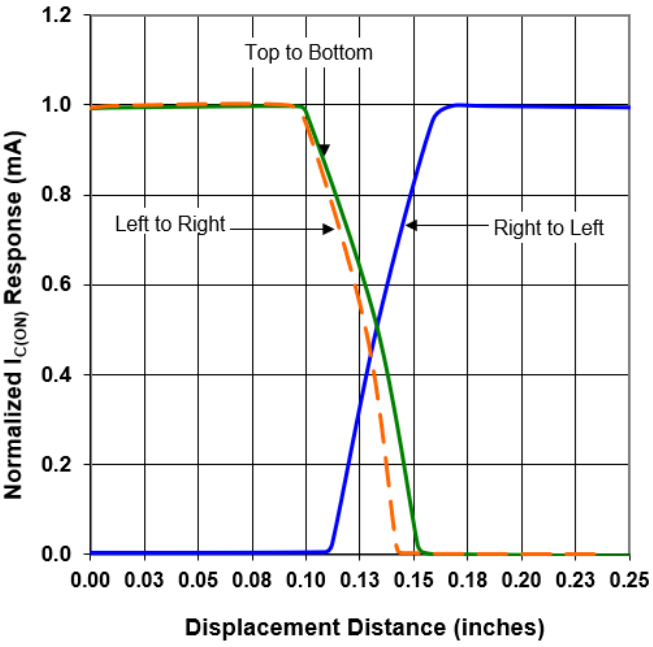
OPB820 - Flag Next to Emitter

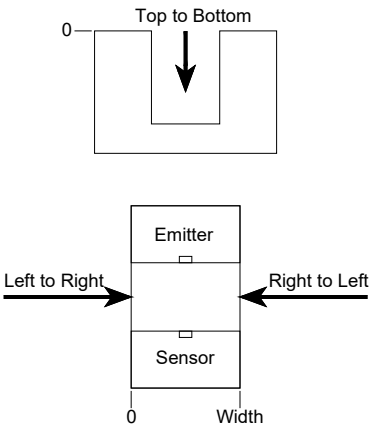


OPB820 - Flag next to Sensor



OPB820 - Flag in Middle of Slot



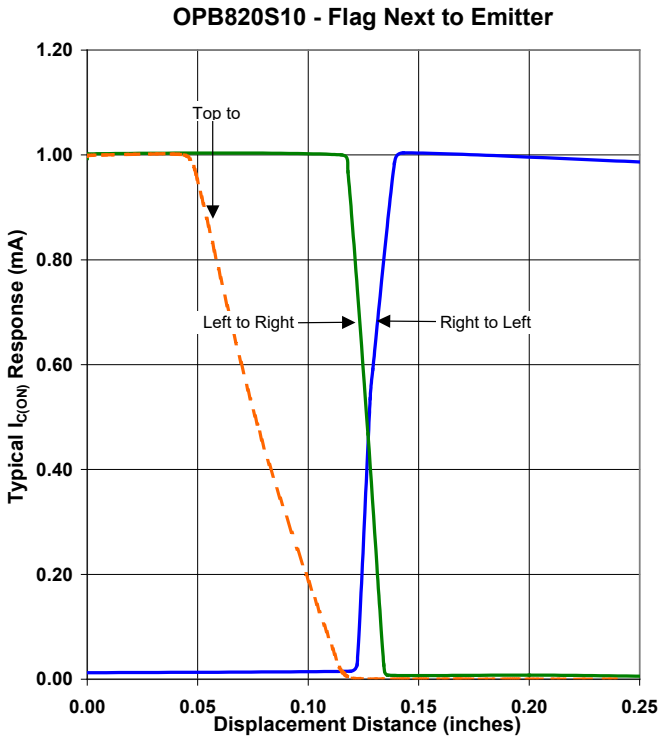


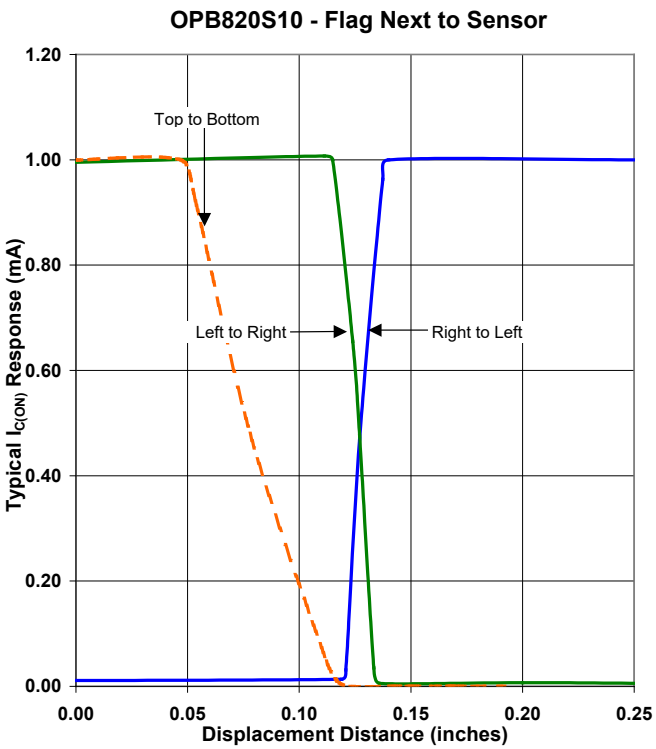
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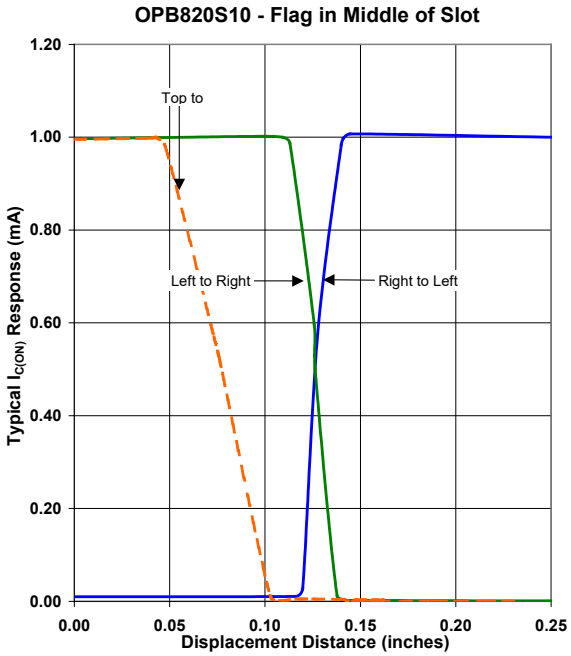
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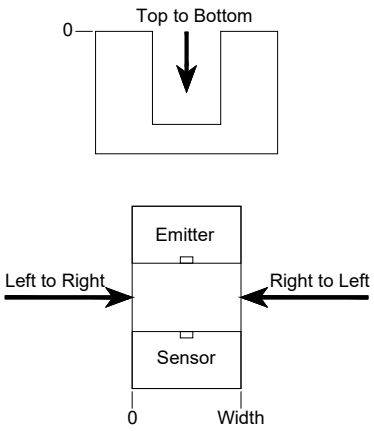
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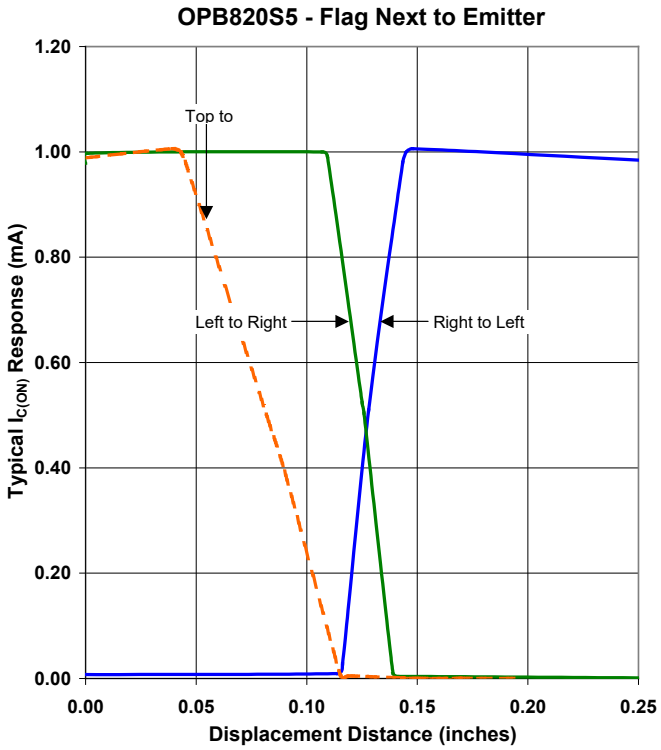


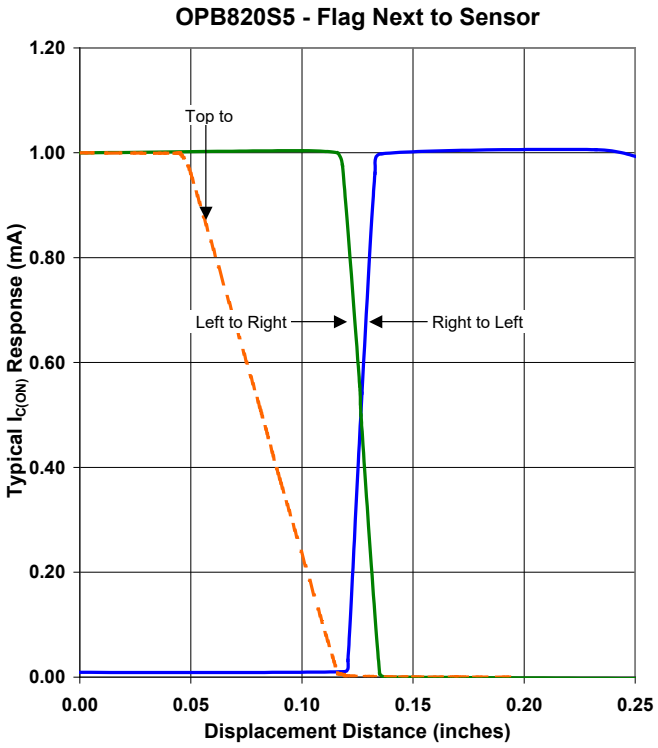
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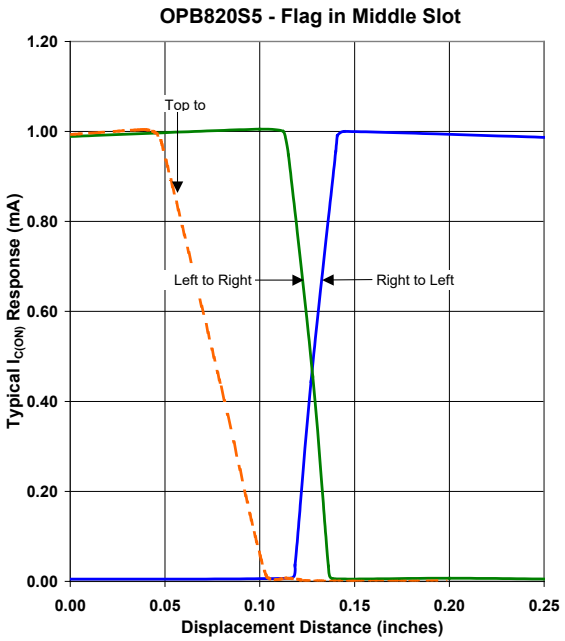
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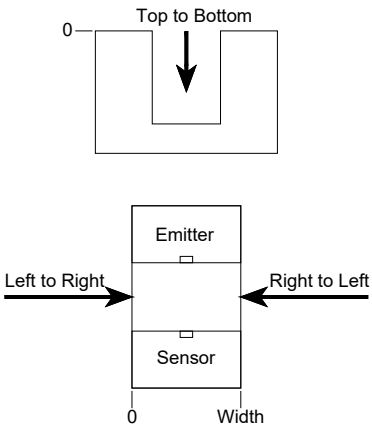
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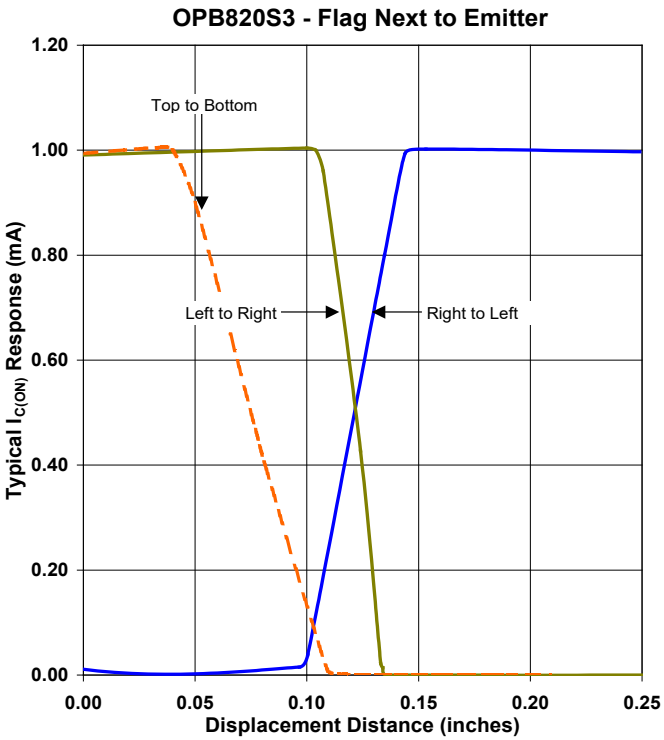


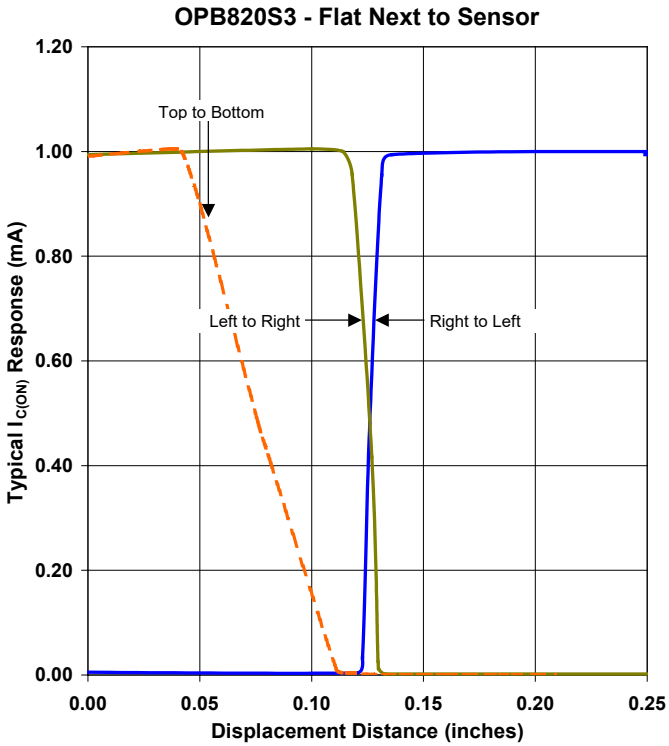
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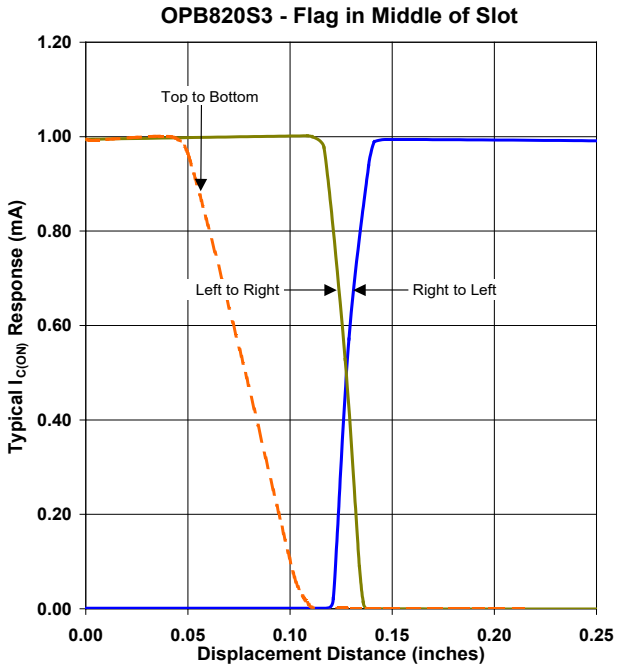
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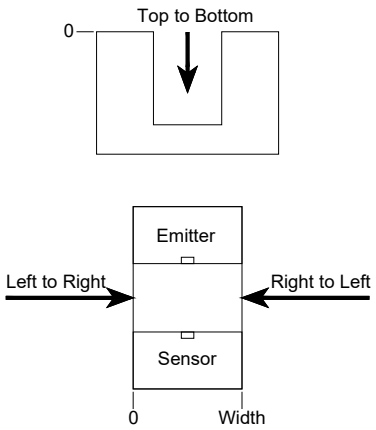
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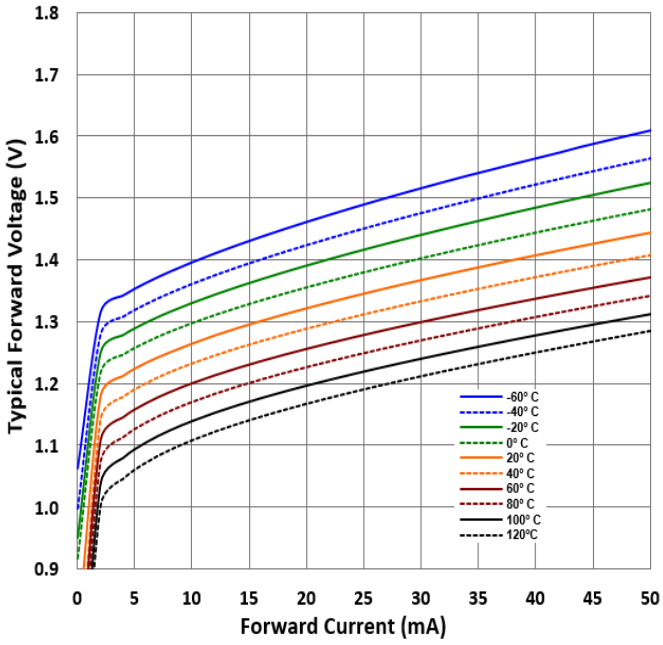
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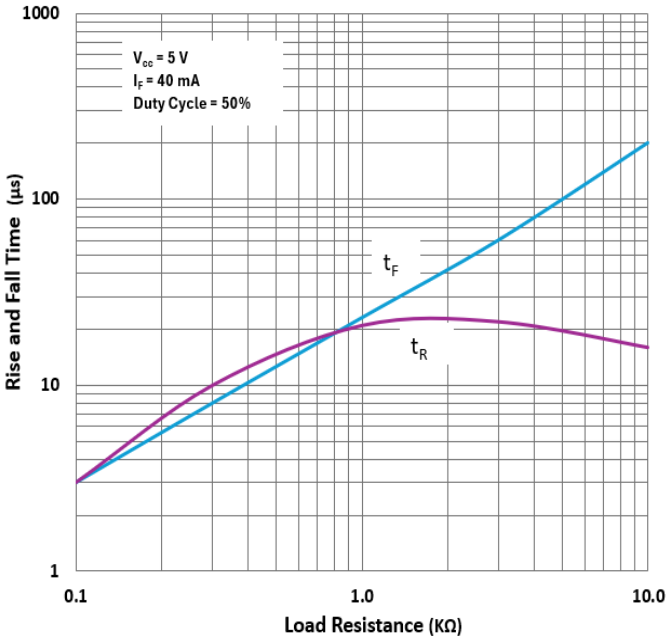
Typical Performance

890nm LED Forward Voltage vs I_F vs Temp



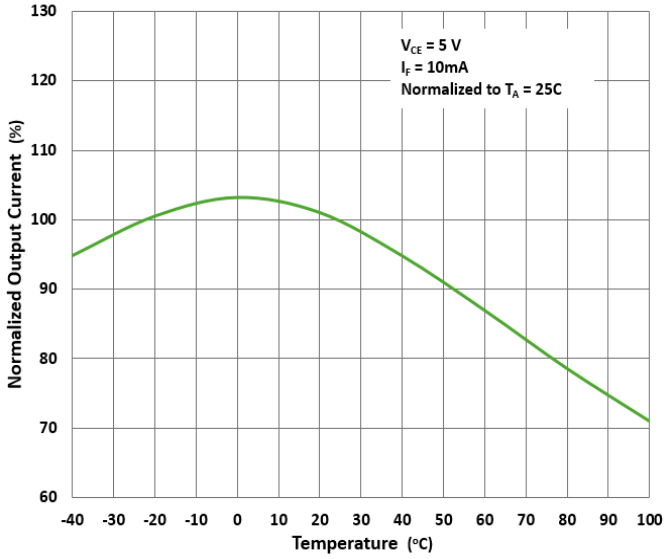
OPB820. OPB821Z

Transistor Output - Rise and Fall Time

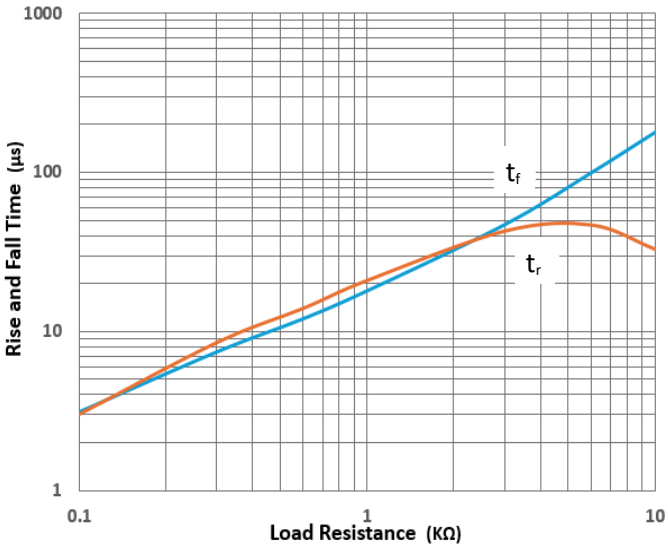


OPB820S10, OPB820S5, OPB820S3
OPB821S10Z, OPB821S5Z, OPB821S3Z

Output Current vs Temperature



Rise and Fall time vs Load Resistance



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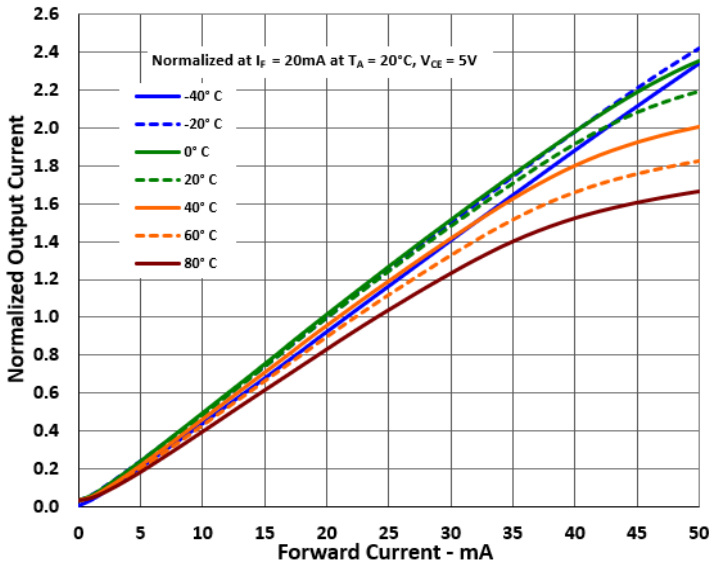
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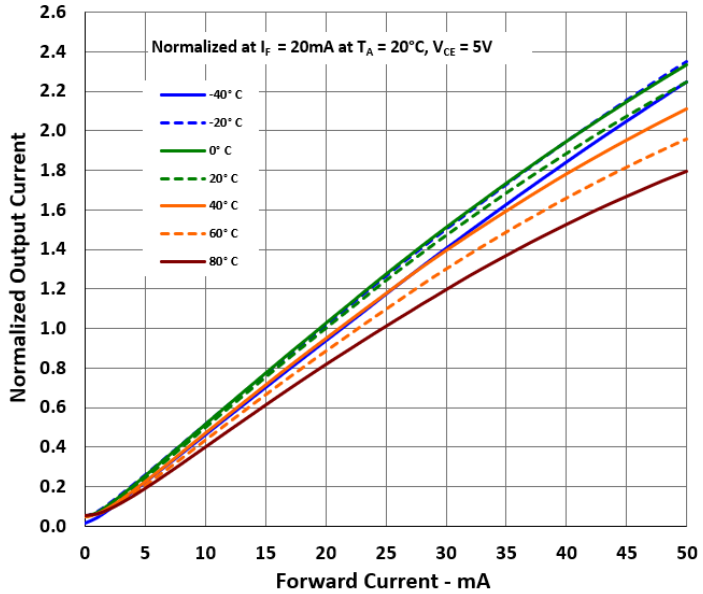
OPB820. OPB821Z

Output Current vs Forward Current vs Temp



OPB820S10, OPB820S5, OPB820S3
OPB821S10Z, OPB821S5Z, OPB821S3Z

Output Current vs Forward Current vs Temp



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