

Slotted Optical Switch

OPB852A1-3

OPB853A1-3



Features:

- Inexpensive opaque plastic housing
- Choice of transistor (OPB852) or photodarlington (OPB853) output
- 0.125" (3.18 mm) slot width
- 0.290" (7.37 mm) lead spacing
- Apertured for high resolution



Description:

Slotted optical switches in the OPB852, and OPB853 series consist of an infrared emitting diode and a NPN silicon phototransistor or photodarlington, mounted on opposite sides of a 0.125" (3.175 mm) wide slot. The OPB852A, OPB852B and OPB852C have phototransistor output, while the OPB853A, OPB853B and OPB853C have photodarlington output.

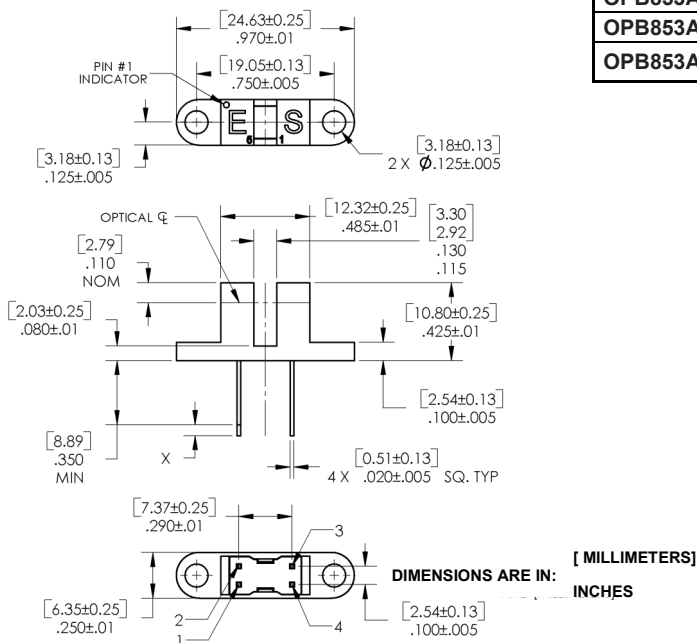
On each of these devices, the emitter has a molded-in aperture of 0.050" x 0.050" (1.270 mm x 1.270 mm) and the phototransistor (OPB852) or photodarlington (OPB853) has a molded-in aperture of 0.010" x 0.050" (0.254 mm x 1.270 mm).

Phototransistor or photodarlington switching occurs when an opaque object passes through the slot.

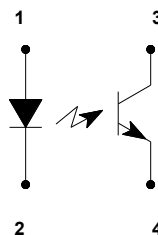
Applications:

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

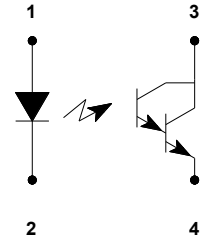
Part Number	LED Peak Wavelength	Sensor	Slot Width/ Depth	Aperture Emitter/ Sensor	Lead Length / Spacing
OPB852A1	890 nm	Transistor	0.120" / 0.315"	0.05" / 0.01"	0.425" / 0.290"
OPB852A2					
OPB852A3					
OPB853A1		Darlington			
OPB853A2					
OPB853A3					



OPB852



OPB853



Pin #	Description
1	Anode
2	Cathode
3	Collector
4	Emitter



RoHS

General Note

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Electrical Specifications

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Storage & Operating Temperature Range	-40°C to $+85^{\circ}\text{C}$
Lead Soldering Temperature [1/16 inch (1.6mm) from the case for 5 sec. with soldering iron]	$260^{\circ}\text{C}^{(1)}$

Input Diode

Forward DC Current	40 mA
Peak Forward Current (1 μs pulse width, 300 pps)	3 A
Reverse DC Voltage	2 V
Power Dissipation	100 mW ⁽²⁾

Output Phototransistor

Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5 V
Power Dissipation	100 mW ⁽²⁾

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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Input Diode (see OP140 for additional information—OPB852A_, OP245 for additional information—OPB853A)

V_F	Forward Voltage	-	-	1.7	V	$I_F = 20\text{ mA}$
I_R	Reverse Current	-	-	100	μA	$V_R = 2\text{ V}$

Output Phototransistor (see OP550 for additional information—OPB852A_, OP565 for additional information—OPB853A)

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage					
	OPB852A1, OPB852A2, OPB852A3	30	-	-	V	$I_C = 1\text{ mA}$
	OPB853A1, OPB853A2, OPB853A3	15	-	-	V	$I_C = 1\text{ mA}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	$I_E = 100\text{ }\mu\text{A}$
I_{CEO}	Collector-Emitter Dark Current	-	-	100	nA	$V_{CE} = 10\text{ V}$

Combined

$V_{CE(SAT)}$	Saturation Voltage					
	OPB852A1, OPB852A2	-	-	0.4	V	$I_C = 500\text{ }\mu\text{A}$, $I_F = 20\text{ mA}$
	OPB852A3	-	-	0.4	V	$I_C = 1.8\text{ mA}$, $I_F = 20\text{ mA}$
	OPB853A1, OPB853A2, OPB853A3	-	-	1.0	V	$I_C = 1.8\text{ mA}$, $I_F = 10\text{ mA}$
$I_{C(ON)}$	On-State Collector Current					
	OPB852A1	1.0	-	-	mA	$V_{CE} = 5\text{ V}$, $I_F = 20\text{ mA}$
	OPB852A2	2.0	-	-	mA	$V_{CE} = 5\text{ V}$, $I_F = 20\text{ mA}$
	OPB852A3	4.0	-	-	mA	$V_{CE} = 5\text{ V}$, $I_F = 20\text{ mA}$
	OPB853A1	2.5	-	-	mA	$V_{CE} = 1.5\text{ V}$, $I_F = 5\text{ mA}$
	OPB853A2	5.0	-	-	mA	$V_{CE} = 1.5\text{ V}$, $I_F = 5\text{ mA}$
	OPB853A3	10.0	-	-	mA	$V_{CE} = 1.5\text{ V}$, $I_F = 5\text{ mA}$

Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (2) Derate linearly 1.67 mW/ $^{\circ}\text{C}$ above 25°C .
- (3) Methanol and isopropanol are recommended as cleaning agents. Housings are soluble in chlorinated hydrocarbons and ketones. Highly activated, water soluble fluxes may attack housings in some situations.
- (4) All parameters tested using pulse technique.

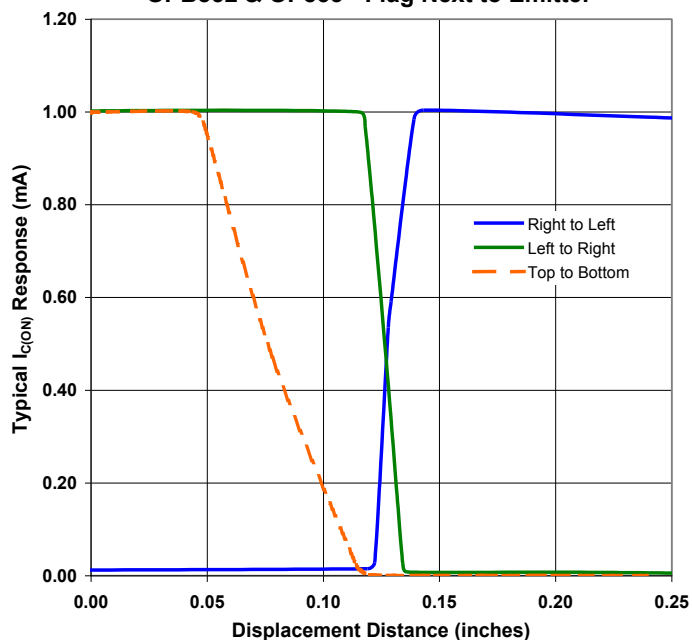
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OPB852A1-3, OPB853A1-3

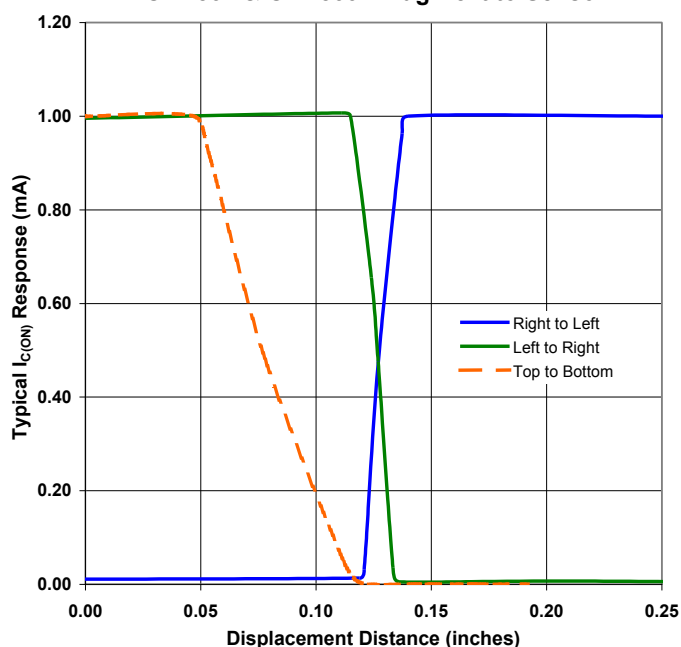


Performance

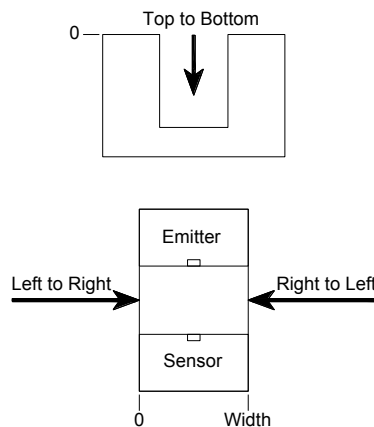
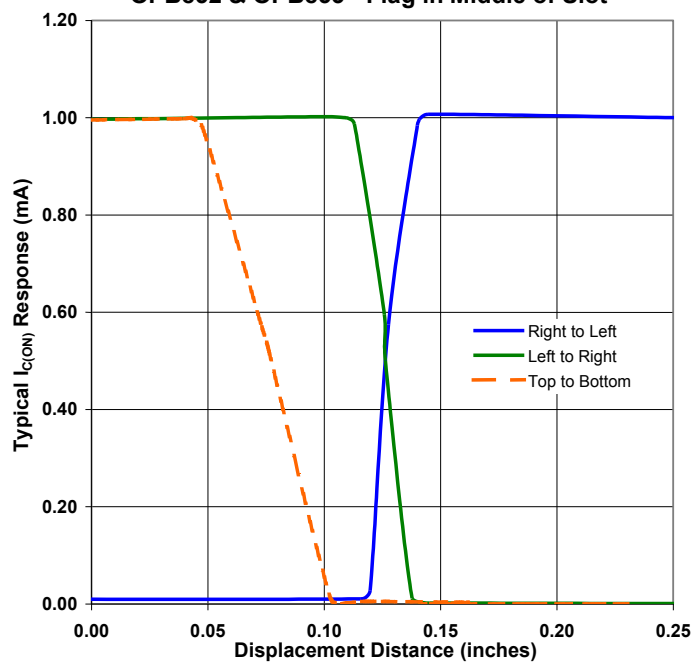
OPB852 & OP853 - Flag Next to Emitter



OPB852 & OPB853 - Flag Next to Sensor



OPB852 & OPB853 - Flag in Middle of Slot



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