

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.

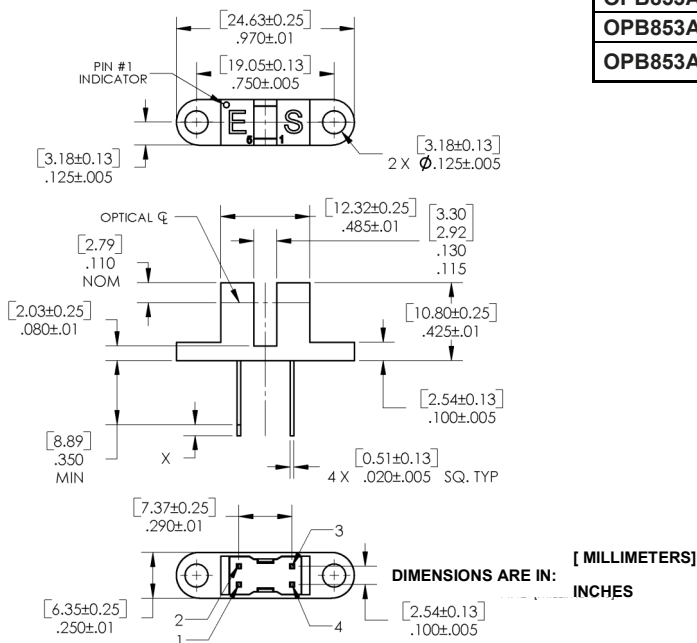
On each of these devices, the emitter has a molded-in aperture of 0.050" x 0.050" (1.270 mm x 1.270 mm) and the phototransistor (OPB852) or photodarlington (OPB853) has a molded-in aperture of 0.010" x 0.050" (0.254 mm x 1.270 mm).

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

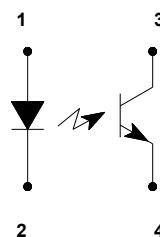
Applications:

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

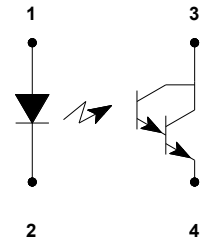
| Part Number | LED Peak Wavelength | Sensor | Slot Width/Depth | Aperture Emitter/Sensor | Lead Length / Spacing |
|-------------|---------------------|------------|------------------|-------------------------|-----------------------|
| OPB852A1 | 890 nm | Transistor | 0.120" / 0.315" | 0.05" / 0.01"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



OPB852



OPB853



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



General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

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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°C |
| Lead Soldering Temperature [1/16 inch (1.6mm) from the case for 5 sec. with soldering iron] | 260°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 |
|--------|-----------|-----|-----|-----|-------|-----------------|
|--------|-----------|-----|-----|-----|-------|-----------------|

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

Combined

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

Notes:

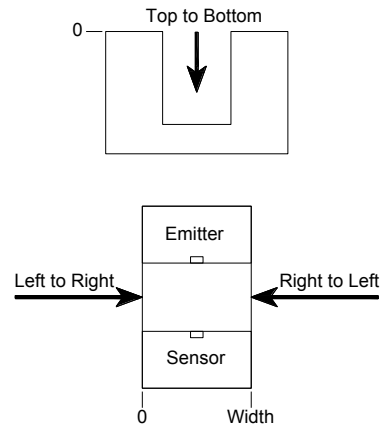
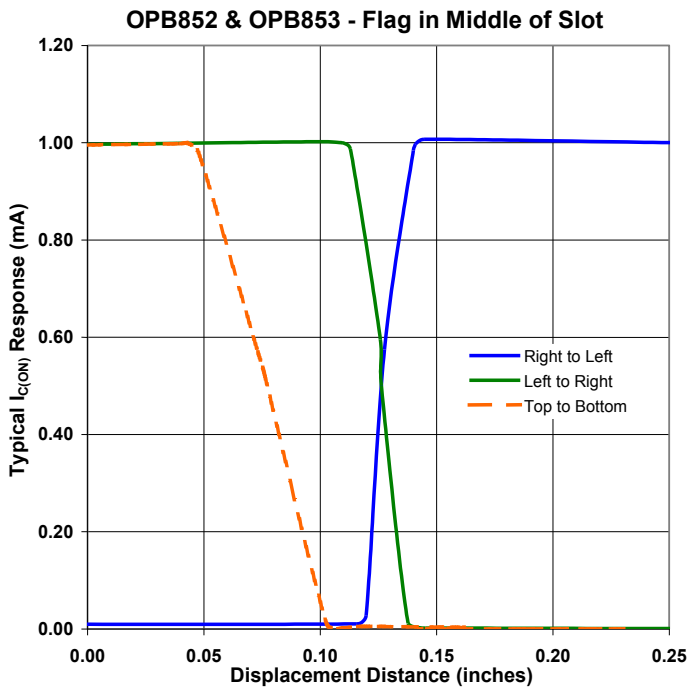
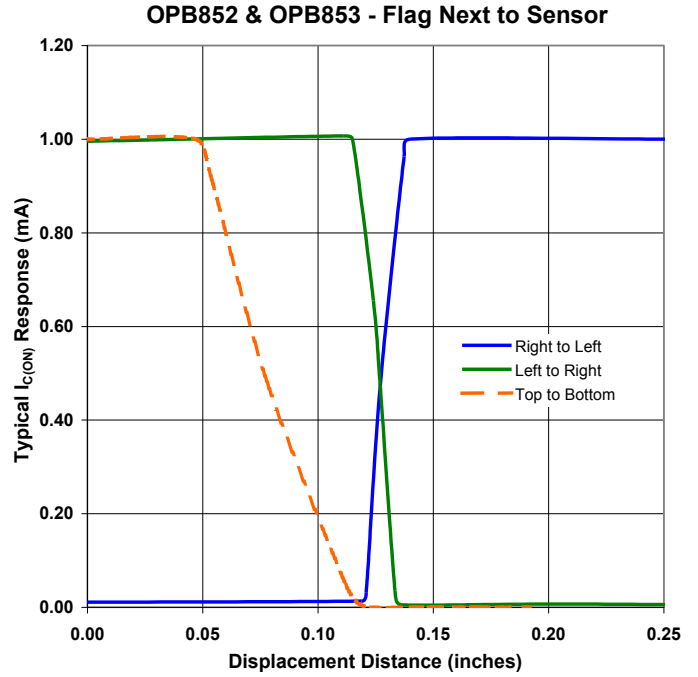
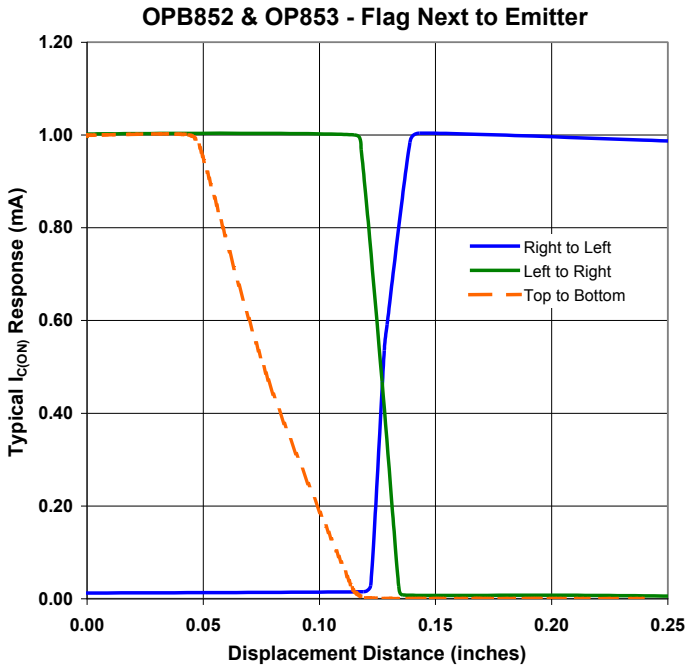
- (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (2) Derate linearly 1.67 mW/°C above 25°C.
- (3) Methanol and isopropanol are recommended as cleaning agents. Housings are soluble in chlorinated hydrocarbons and ketones. Highly activated, water soluble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

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Performance



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