

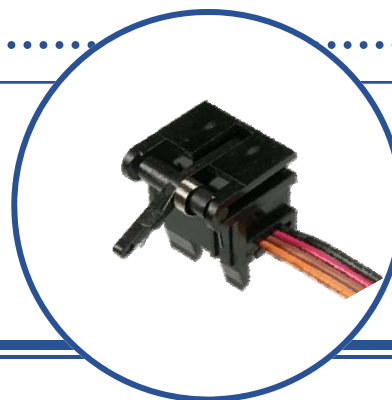
# Slotted Optical Flag Switch

## OPB850A, OPB850-1Z



### Features:

- Snap into PCBoard mounting
- Transistor output
- Mechanical switch replacement
- Four 18" (457 mm) 26 AWG, UL wires for electrical connections
- Choice of phototransistor or Rbe phototransistor output



### Description:

Each **OPB850A** switch has a NPN phototransistor coupled with a 940 nm gallium arsenide infrared emitting diode in a molded plastic housing. Each **OPB850-1Z** has a Rbe phototransistor coupled with an 880 nm gallium arsenide infrared emitting diode in a molded plastic housing. An actuated lever arm flag interrupts the light beam, which switches the transistor output between states that can readily drive logic gates.

These devices are designed to replace conventional mechanical limit switches where long life and reliability are critical. The switches are designed to easily snap mount into a 0.036 inch (0.914 mm) 20 gage thick material with a rectangular opening of 0.315" x 0.472" (8.0 mm x 12.0 mm).

Minor differences exist in the package between the **OPB850A** and **OPB850-1Z** (see drawings below). The cable exits the package in different locations.

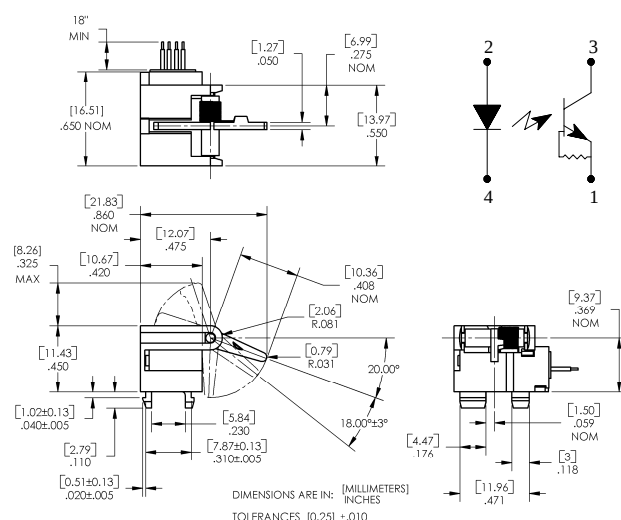
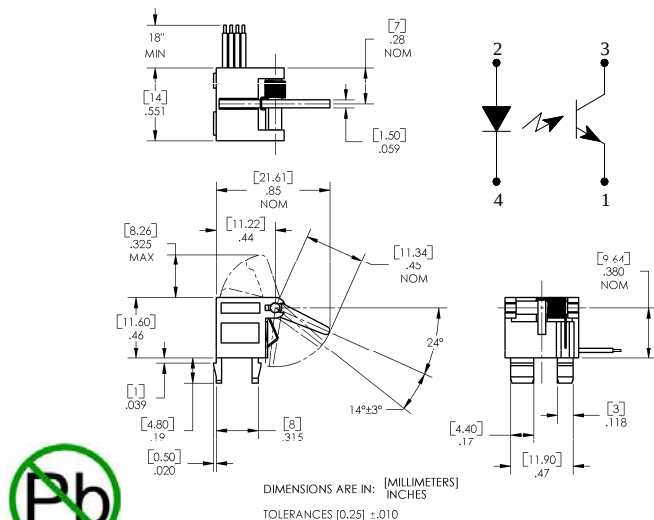
Custom electrical, wire and cabling and connectors are available. Contact your local representative or OPTEK for more information.

### Applications:

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

| OPB850A, OPB850-1Z |             |
|--------------------|-------------|
| Pin # / Color      | Description |
| 1-Black            | Emitter     |
| 2-Red              | Anode       |
| 3-Brown            | Collector   |
| 4-Orange           | Cathode     |

| Ordering Information |            |                                                |
|----------------------|------------|------------------------------------------------|
| Part Number          | Wavelength | Description                                    |
| OPB850A              | 940 nm     | Slotted Optical Flag Switch 18" (457 mm) wires |
| OPB850-1Z            | 880 nm     | Slotted Optical Flag Switch 18" (457 mm) wires |



RoHS

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

# Slotted Optical Flag Switch

## OPB850A, OPB850-1Z



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

|                                                                                              |                |
|----------------------------------------------------------------------------------------------|----------------|
| Operating Temperature Range                                                                  | -20°C to +75°C |
| Storage Temperature Range                                                                    | -40°C to +85°C |
| Lead Soldering Temperature [1/16 inch (1.6 mm) from the case for 5 sec. with soldering iron] | 260°C          |

### Input Diode

|                                                              |       |
|--------------------------------------------------------------|-------|
| Reverse Voltage                                              | 5 V   |
| Continuous Forward Current                                   | 50 mA |
| Peak Forward Current (10 $\mu\text{s}$ pulse width, 300 pps) | 1 A   |
| Power Dissipation                                            | 75 mW |

### Output Phototransistor

|                           |        |
|---------------------------|--------|
| Collector-Emitter Voltage | 24 V   |
| Emitter-Collector Voltage | 5 V    |
| Collector DC Current      | 20 mA  |
| Power Dissipation         | 100 mW |

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**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 | - | 1.2 | 1.6 | V             | $I_F = 20 \text{ mA}$ |
| $I_R$ | Reverse Current | - | -   | -   | $\mu\text{A}$ | $V_R = 2 \text{ V}$   |

**Output Phototransistor (OPB850A)**

|               |                                     |    |   |     |    |                                  |
|---------------|-------------------------------------|----|---|-----|----|----------------------------------|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | 30 | - | -   | V  | $I_C = 100 \mu\text{A}, E_E = 0$ |
| $V_{(BR)ECO}$ | Emitter-Collector Breakdown Voltage | 5  | - | -   | V  | $I_E = 100 \mu\text{A}, E_E = 0$ |
| $I_{CEO}$     | Collector-Emitter Dark Current      | -  | - | 100 | nA | $V_{CE} = 10 \text{ V}, E_E = 0$ |

**Coupled (OPB850A)**

|               |                                                     |     |   |     |               |                                              |
|---------------|-----------------------------------------------------|-----|---|-----|---------------|----------------------------------------------|
| $V_{CE(SAT)}$ | Collector-Emitter Saturation Voltage <sup>(1)</sup> | -   | - | 0.4 | V             | $I_C = 250 \mu\text{A}, I_F = 20 \text{ mA}$ |
| $I_{C(ON)}$   | On-State Collector Current <sup>(1)</sup>           | 0.5 | 2 | -   | mA            | $V_{CE} = 5 \text{ V}, I_F = 20 \text{ mA}$  |
| $I_{C(OFF)}$  | Off-State Collector Current <sup>(2)</sup>          | -   | - | 10  | $\mu\text{A}$ | $V_{CE} = 5 \text{ V}, I_F = 20 \text{ mA}$  |

**Output Phototransistor (OPB850-1Z)**

|               |                                     |     |   |     |    |                                  |
|---------------|-------------------------------------|-----|---|-----|----|----------------------------------|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | 24  | - | -   | V  | $I_C = 100 \mu\text{A}, E_E = 0$ |
| $V_{(BR)ECO}$ | Emitter-Collector Breakdown Voltage | 0.4 | - | -   | V  | $I_E = 100 \mu\text{A}, E_E = 0$ |
| $I_{CEO}$     | Collector-Emitter Dark Current      | -   | - | 100 | nA | $V_{CE} = 10 \text{ V}, E_E = 0$ |

**Coupled (OPB850-1Z)**

|               |                                                     |     |   |      |               |                                              |
|---------------|-----------------------------------------------------|-----|---|------|---------------|----------------------------------------------|
| $V_{CE(SAT)}$ | Collector-Emitter Saturation Voltage <sup>(1)</sup> | -   | - | 0.40 | V             | $I_C = 500 \mu\text{A}, I_F = 20 \text{ mA}$ |
| $I_{C(ON)}$   | On-State Collector Current <sup>(1)</sup>           | 0.5 | 2 | -    | mA            | $V_{CE} = 10 \text{ V}, I_F = 20 \text{ mA}$ |
| $I_{C(OFF)}$  | Off-State Collector Current <sup>(2)</sup>          | -   | - | 10   | $\mu\text{A}$ | $V_{CE} = 10 \text{ V}, I_F = 20 \text{ mA}$ |

**Notes:**

- (1) ON ( $I_{C(ON)}$ ) electrical condition corresponds to the switch point at about  $41^\circ$  angular displacement of the arm.
- (2) OFF ( $I_{C(OFF)}$ ) electrical condition corresponds to the mechanical arm position at rest.
- (3) From the rest position to the switch point, lever torque measured at the end of the arm is 1.5 grams maximum.
- (4) Wires are 26 AWG, UL rated.

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