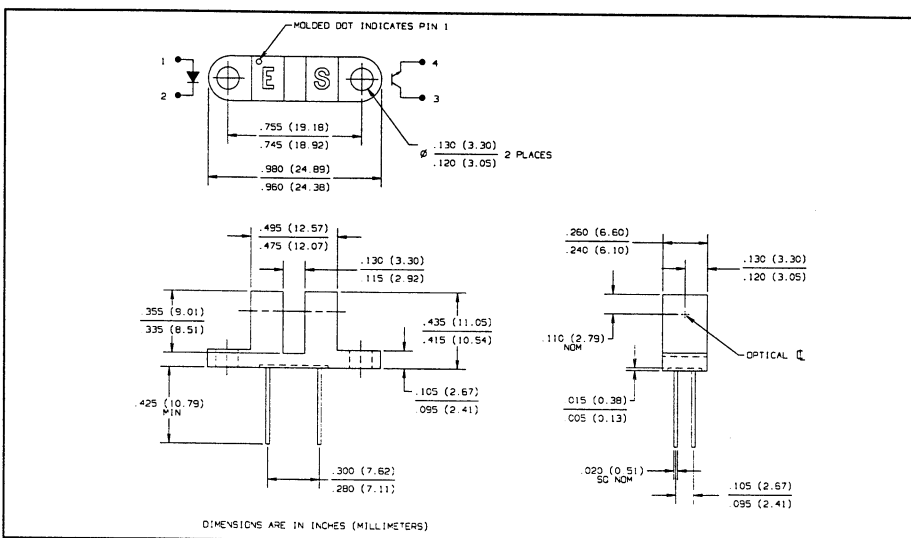
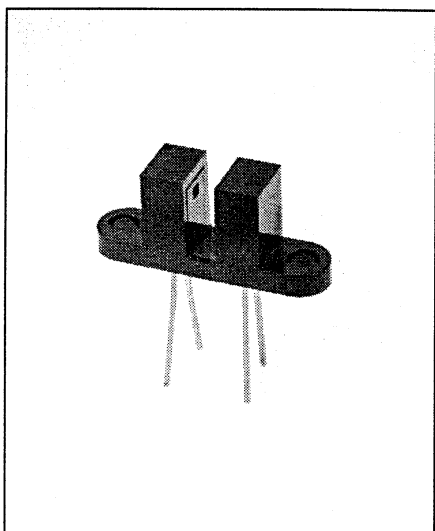


# Slotted Optical Switches

## Types OPB852A1, OPB852A2, OPB852A3



### Features

- Inexpensive opaque plastic housing
- 0.125" (3.18 mm) wide slot
- 0.290" (7.37 mm) lead spacing
- Apertured for high resolution

### Description

The OPB852A series of slotted optical switches consist of an infrared emitting diode and an NPN silicon phototransistor. They are mounted on opposite sides of a 0.125" (3.18 mm) wide slot. The emitter has a 0.050" X 0.050" (1.27 mm X 1.27 mm) molded-in aperture while the phototransistor has a 0.010" X 0.050" (0.254 mm X 1.27 mm) molded-in aperture.

### Absolute Maximum Ratings (T<sub>A</sub> = 25° C unless otherwise noted)

Storage and Operating Temperature Range ..... -40° C to +85° C  
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron]..... 240° C<sup>(1)</sup>

### Input Diode

Forward DC Current ..... 40 mA  
Peak Forward Current (1 μs pulse width, 300 pps) ..... 3.0 A  
Reverse DC Voltage ..... 2.0 V  
Power Dissipation ..... 100 mW<sup>(2)</sup>

### Output Phototransistor

Collector-Emitter Voltage ..... 30 V  
Emitter-Collector Voltage ..... 5.0 V  
Power Dissipation ..... 100 mW<sup>(2)</sup>

### Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
- (2) Derate linearly 1.67 mW/° C above 25° C.
- (3) All parameters tested using pulse technique.
- (4) 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.

# Types OPB852A1, OPB852A2, OPB852A3

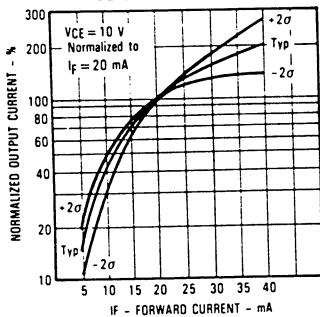
Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

| SYMBOL                        | PARAMETER                           | MIN                              | MAX                  | UNITS          | TEST CONDITIONS  |
|-------------------------------|-------------------------------------|----------------------------------|----------------------|----------------|--|
| <b>Input Diode</b>            |                                     |                                  |                      |                |  |
| $V_F$                         | Forward Voltage                     |                                  | 1.7                  | V              | $I_F = 20\text{ mA}$   |
| $I_R$                         | Reverse Current                     |                                  | 100                  | $\mu\text{A}$  | $V_R = 2\text{ V}$   |
| <b>Output Phototransistor</b> |                                     |                                  |                      |                |  |
| $V_{(BR)CEO}$                 | Collector-Emitter Breakdown Voltage | 30                               |                      | V              | $I_C = 1\text{ mA}$  |
| $V_{(BR)ECO}$                 | Emitter-Collector Breakdown Voltage | 5.0                              |                      | V              | $I_E = 100\text{ }\mu\text{A}$   |
| $I_{CEO}$                     | Collector-Emitter Dark Current      |                                  | 100                  | nA             | $V_{CE} = 10\text{ V}$   |
| <b>Coupled</b>                |                                     |                                  |                      |                |  |
| $V_{CE(SAT)}$                 | Saturation Voltage                  | OPB852A1<br>OPB852A2<br>OPB852A3 | 0.40<br>0.40<br>0.40 | V<br>V<br>V    | $I_C = 500\text{ }\mu\text{A}$ , $I_F = 20\text{ mA}$<br>$I_C = 500\text{ }\mu\text{A}$ , $I_F = 20\text{ mA}$<br>$I_C = 1.8\text{ mA}$ , $I_F = 20\text{ mA}$ |
| $I_{C(ON)}$                   | On-State Collector Current          | OPB852A1<br>OPB852A2<br>OPB852A3 | 1.0<br>2.0<br>4.0    | mA<br>mA<br>mA | $V_{CE} = 5\text{ V}$ , $I_F = 20\text{ mA}$<br>$V_{CE} = 5\text{ V}$ , $I_F = 20\text{ mA}$<br>$V_{CE} = 5\text{ V}$ , $I_F = 20\text{ mA}$                   |

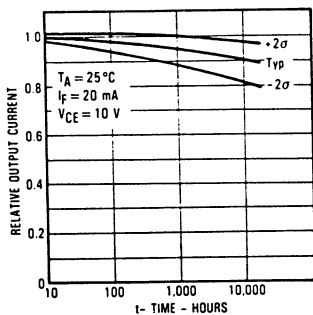
SLOTTED OPTICAL SWITCHES

## Typical Performance Curves

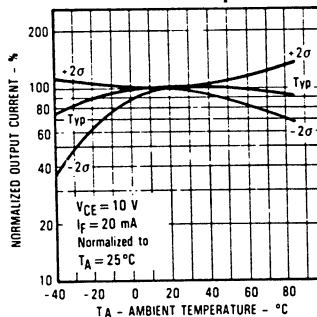
**Normalized Output Current vs Forward Current**



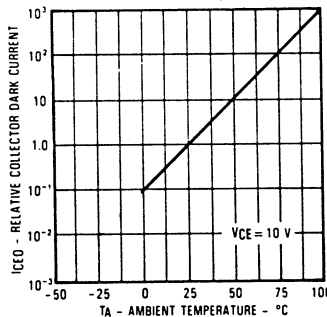
**Relative Output Current vs Time**



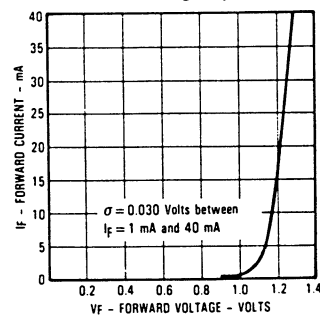
**Normalized Output Current vs Ambient Temperature**



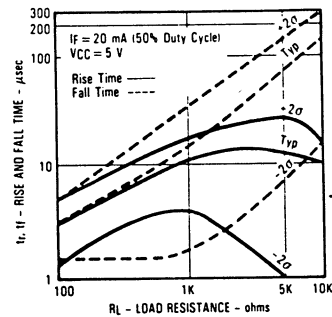
**Collector Dark Current vs Ambient Temperature**



**Forward Current vs Forward Voltage Input Diode**



**Rise and Fall Time vs Load Resistance**



**Reduction in Output Current Due to LED Heating vs Forward Current**

