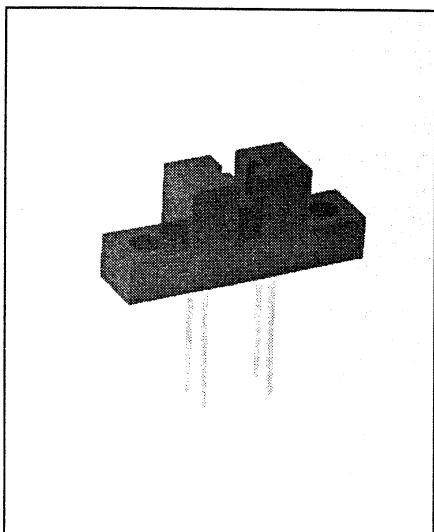


# Slotted Optical Switches

## Types OPB854A3, OPB854B3

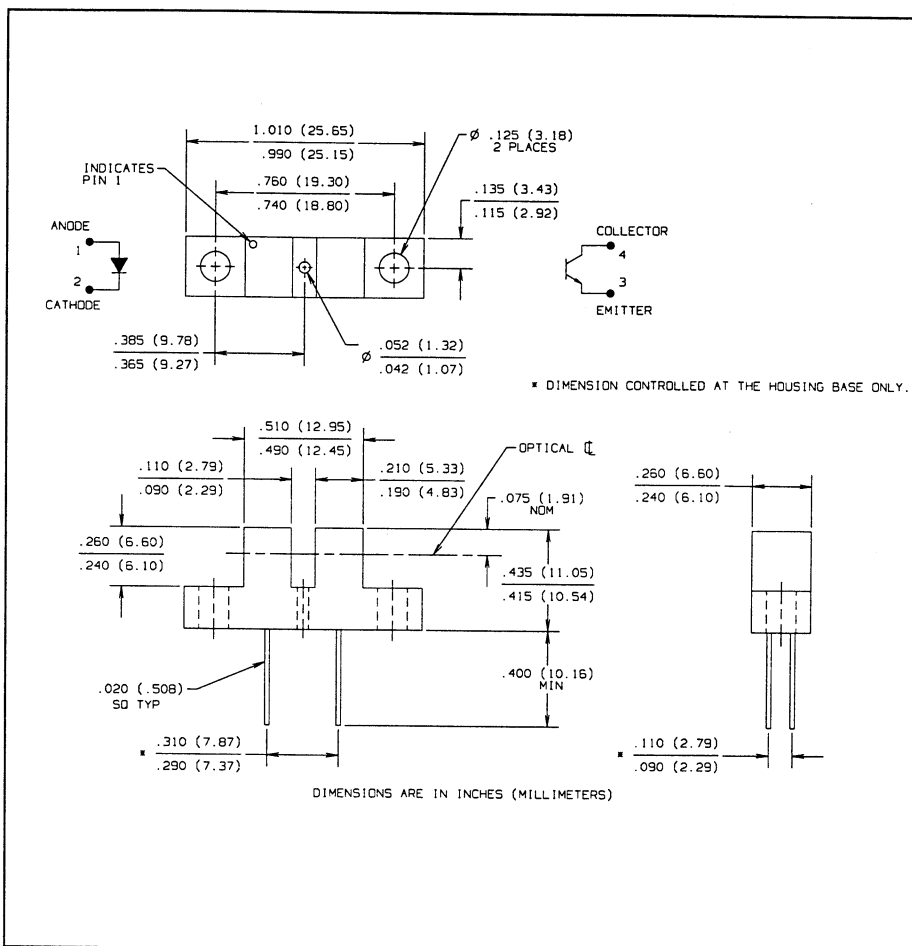


### Features

- Non-contact switching
- Printed circuit board mounting
- 0.100" (2.54 mm) wide slot
- 0.300" (7.62 mm) lead spacing
- Opaque plastic housing

### Description

The OPB854A3 and OPB854B3 each consist of an infrared emitting diode and an NPN silicon phototransistor mounted on opposite sides of a 0.100" (2.54 mm) wide slot in an inexpensive plastic housing. Switching of the phototransistor occurs whenever an opaque object passes through the slot. Also available without mounting tab as OPB854A1 and OPB854B1, or with one mounting tab as OPB854A2 and OPB854B2.



### 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 . . . . . 50 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  
 Collector DC Current . . . . . 30 mA  
 Power Dissipation . . . . . 100 mW

#### 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 or isopropanol are recommended as cleaning agents. Plastic housing is soluble in chlorinated hydrocarbons and ketones.

# Types OPB854A3, OPB854B3

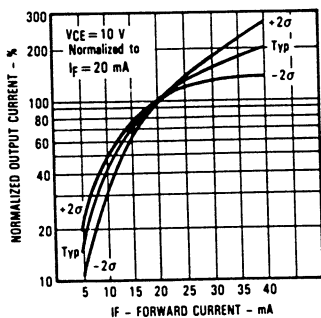
Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

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		10	$\mu\text{A}$	$V_R = 2\text{ V}$
<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	$I_E = 100\ \mu\text{A}$
$I_{CEO}$	Collector-Emtter Dark Current		100	nA	$V_{CE} = 10\text{ V}, I_F = 0, E_e = 0$
<b>Coupled</b>					
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	OPB854A3 OPB854B3	0.6 0.4	V	$I_C = 2\text{ mA}, I_F = 16\text{ mA}$ $I_C = 250\ \mu\text{A}, I_F = 20\text{ mA}$
$I_{C(ON)}$	On-State Collector Current	OPB854A3 OPB854B3	3.0 1.0	mA	$V_{CE} = 1\text{ V}, I_F = 16\text{ mA}$ $V_{CE} = 10\text{ V}, I_F = 20\text{ mA}$

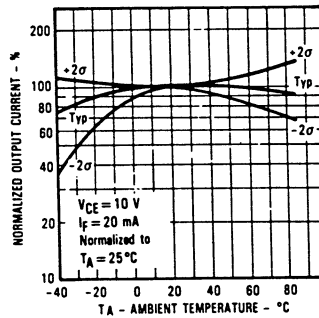
SLOTTED OPTICAL SWITCHES

## Typical Performance Curves

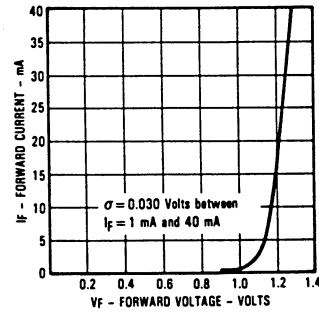
**Normalized Output Current vs Forward Current**



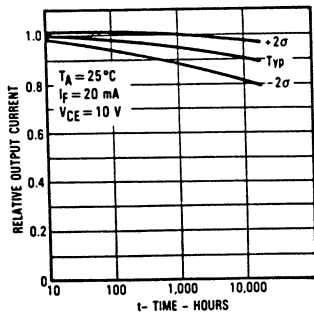
**Normalized Output Current vs Ambient Temperature**



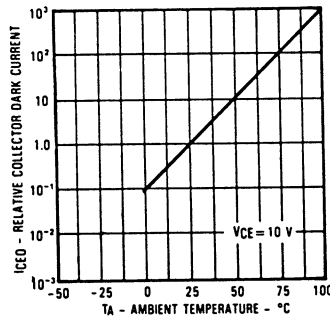
**Forward Current vs Forward Voltage Input Diode**



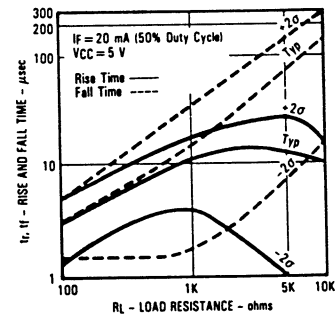
**Relative Output Current vs Time**



**Collector Dark Current vs Ambient Temperature**



**Rise and Fall Time vs Load Resistance**



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

