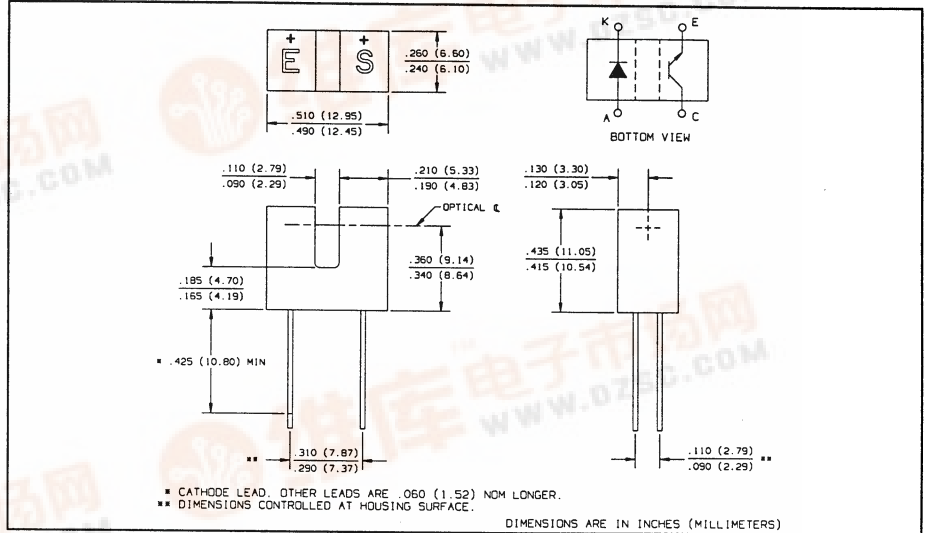
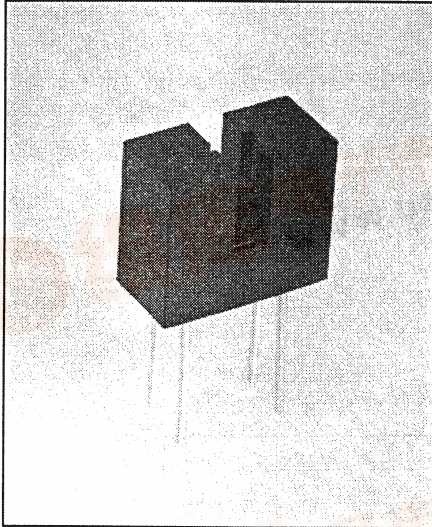




Product Bulletin OPB847  
July 1996

# Slotted Optical Switches

## Types OPB847, OPB848



### Features

- Non-contact switching
- Apertured for high resolution
- Fast switching speed
- 0.300" (7.62 mm) lead spacing
- 0.100" (2.54 mm) wide slot
- TX-TXV process available (see Hi-Rel section)

### Description

The OPB847 and OPB848 each consist of an infrared emitting diode and an NPN silicon phototransistor mounted in a low cost black plastic housing on opposite sides of a 0.100" (2.54 mm) wide slot. Both devices have a 0.025" (0.635 mm) by 0.060" (1.52 mm) aperture in front of the phototransistor for high resolution position sensing.

### Absolute Maximum Ratings (TA = 25°C unless otherwise noted)

Storage and Operating Temperature . . . . . -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

Continuous Forward Current . . . . . 50 mA  
 Peak Forward Current (1 μs pulse width, 300 pps) . . . . . 3.0 A  
 Reverse Voltage . . . . . 2.0 V  
 Power Dissipation . . . . . 100 mW<sup>(2)</sup>

### Output Phototransistor

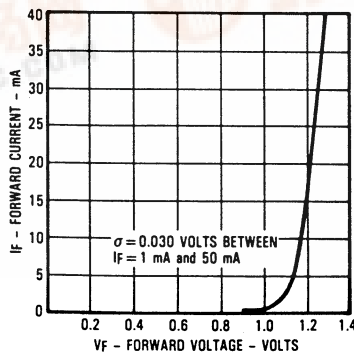
Collector-Emitter Voltage . . . . . 30 V  
 Emitter-Collector Voltage . . . . . 5.0 V  
 Power Dissipation . . . . . 100 mW<sup>(2)</sup>

### Notes:

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

### Typical Performance Curves

Forward Current vs Forward Voltage Input Diodes



# Types OPB847, OPB848

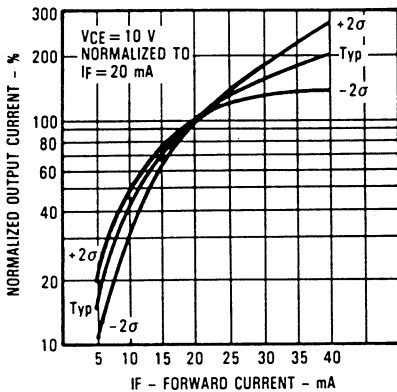
Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

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	$I_E = 100\ \mu\text{A}$
$I_{CEO}$	Collector-Emitter 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	OPB847 OPB848	0.40 0.40	V	$I_C = 2\text{ mA}, I_F = 20\text{ mA}$ $I_C = 0.5\text{ mA}, I_F = 20\text{ mA}$
$I_{C(ON)}$	On-State Collector Current	OPB847 OPB848	4.0 1.0	mA	$V_{CE} = 10\text{ V}, I_F = 20\text{ mA}$ $V_{CE} = 10\text{ V}, I_F = 20\text{ mA}$

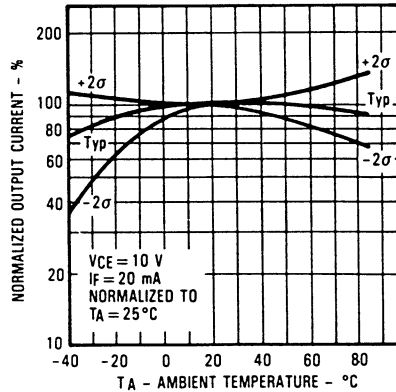
SLOTTED OPTICAL SWITCHES

## Typical Performance Curves

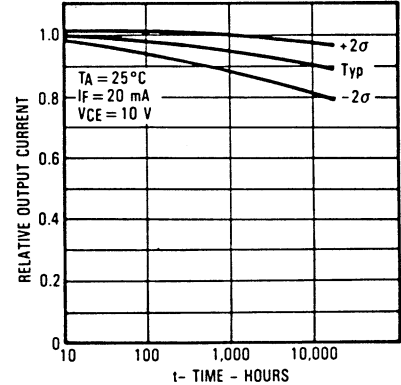
**Normalized Output Current vs Forward Current**



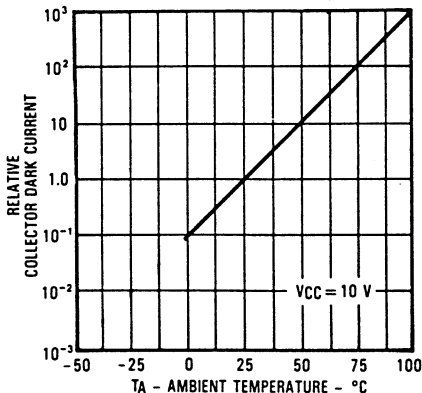
**Normalized Output Current vs Ambient Temperature**



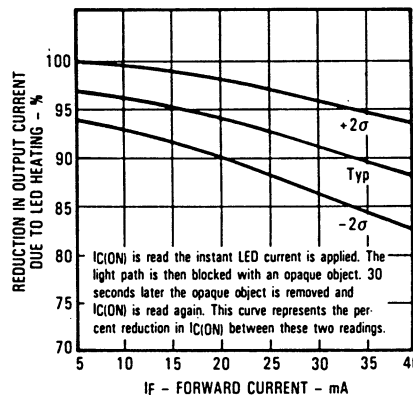
**Relative Output Current vs Time**



**Relative Collector Dark Current vs Ambient Temperature**



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



**Rise and Fall Time vs Load Resistance**

