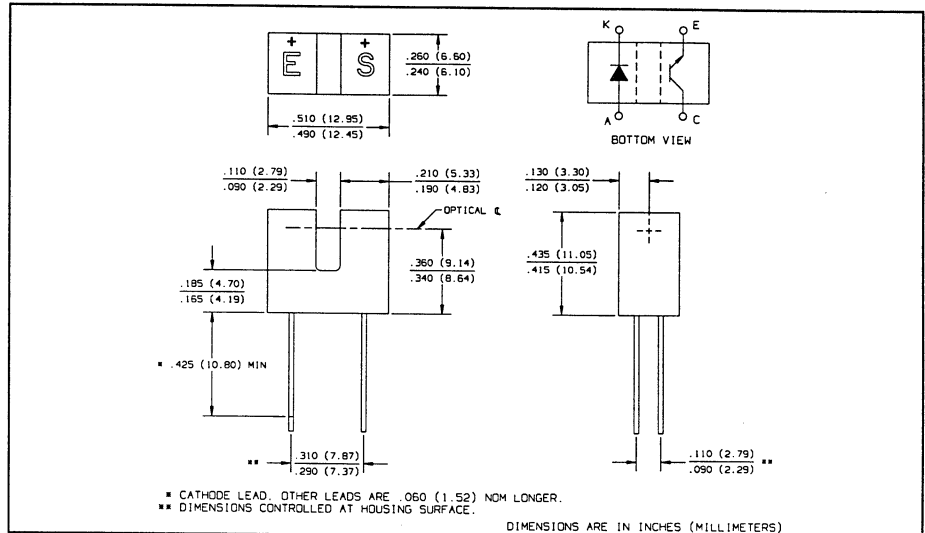
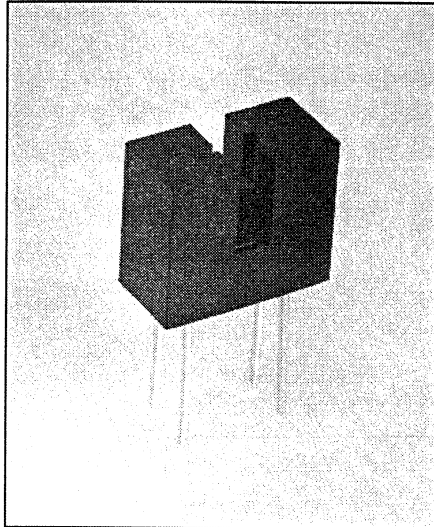


# Slotted Optical Switches

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

Storage and Operating Temperature .....  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$   
 Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron] .....  $240^\circ\text{C}^{(1)}$

### Input Diode

Continuous Forward Current ..... 50 mA  
 Peak Forward Current (1  $\mu\text{s}$  pulse width, 300 pps) ..... 3.0 A  
 Reverse Voltage ..... 2.0 V  
 Power Dissipation ..... 100 mW<sup>(2)</sup>

### Output Phototransistor

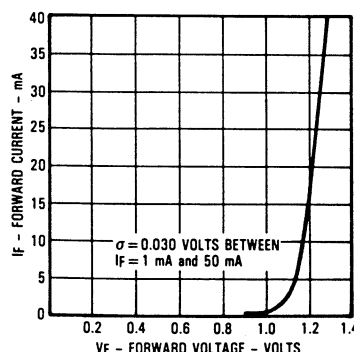
Collector-Emitter Voltage ..... 30 V  
 Emitter-Collector Voltage ..... 5.0 V  
 Power Dissipation ..... 100 mW<sup>(2)</sup>

### Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 sec. max when wave soldering.
- (2) Derate linearly 1.67 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (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

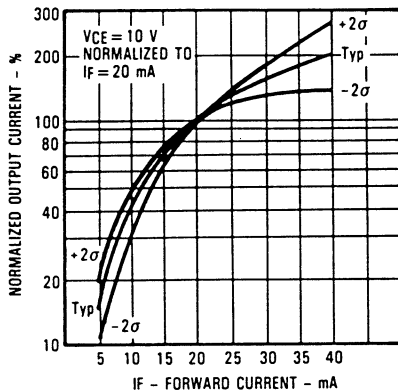
Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

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	$I_E = 100\text{ }\mu\text{A}$
$I_{CEO}$	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 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 mA	$V_{CE} = 10\text{ V}, I_F = 20\text{ mA}$ $V_{CE} = 10\text{ V}, I_F = 20\text{ mA}$

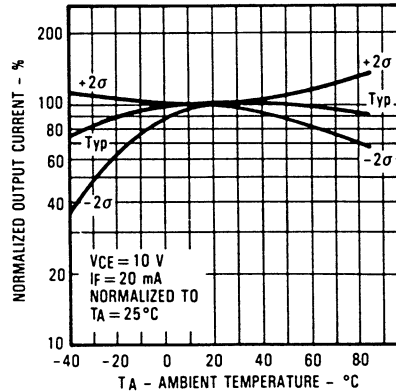
SLOTTED  
OPTICAL  
SWITCHES

## Typical Performance Curves

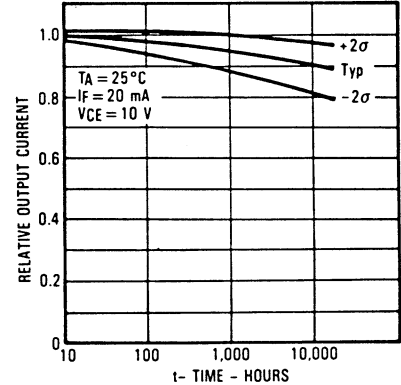
Normalized Output Current  
vs Forward Current



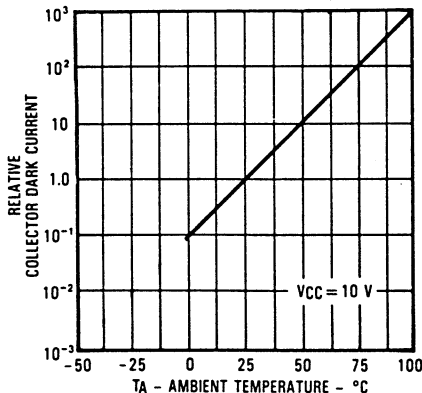
Normalized Output Current  
vs Ambient Temperature



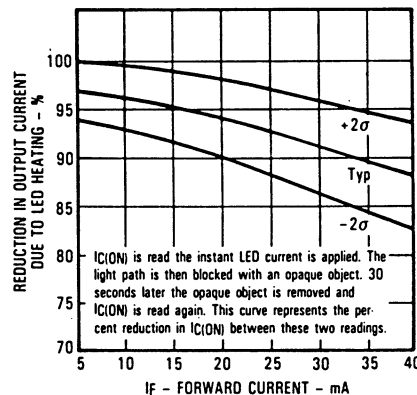
Relative Output Current  
vs Time



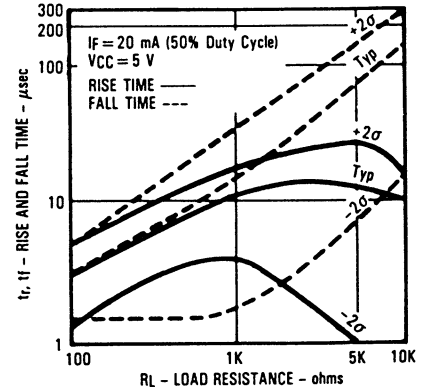
Relative Collector Dark Current  
vs Ambient Temperature



Reduction in Output Current Due to  
LED Heating vs Forward Current



Rise and Fall Time  
vs Load Resistance



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

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