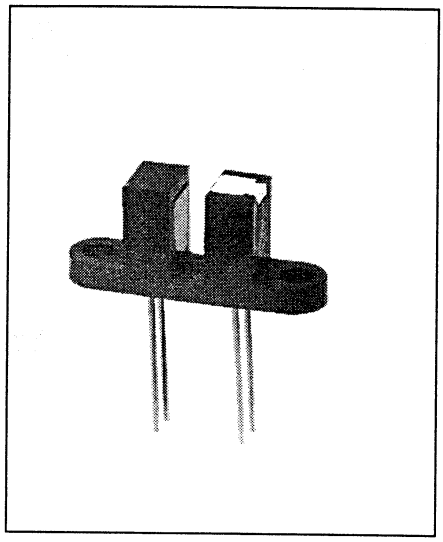
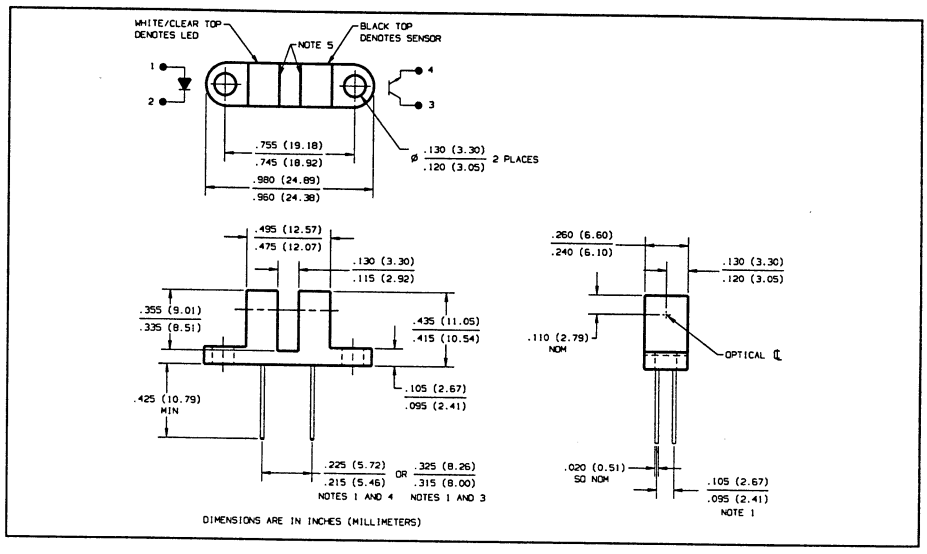
High Resolution Slotted Optical Switch
Type OPB859





Features

- Inexpensive opaque plastic housing
- 0.125" (3.18 mm) wide slot
- 0.220" (5.89 mm) lead spacing
- Apertured for high resolution

Description

The OPB859 slotted optical switch consists of an infrared emitting diode and an NPN silicon phototransistor. They are mounted on opposite sides of a .125" (3.18 mm) wide slot. The emitter has a .050" x .050" (1.27 mm X 1.27 mm) aperture while the phototransistor has a .005" x .050" (0.127 mm X 1.27 mm) aperture.

Absolute Maximum Ratings (T_A = 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(1)

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(2)

Output Phototransistor

Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5.0 V
Power Dissipation	100 mW(2)

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) This dimension controlled at housing surface only.
(5) Methanol or isopropanol are recommended as cleaning agents. Plastic housings are soluble in chlorinated hydrocarbons and ketones.

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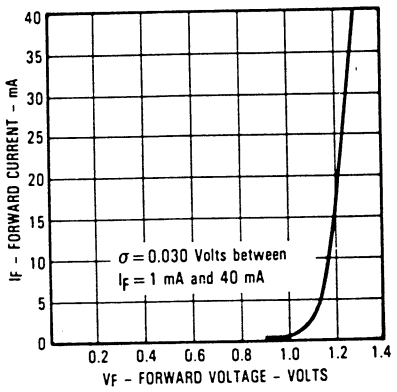
Electrical Characteristics (T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER	MIN	MAX	UNITS	TEST CONDITIONS
Input Diode					
V_F	Forward Voltage		1.7	V	I_F = 20 mA
I_R	Reverse Current		100	µA	V_R = 2.0 V
Output Phototransistor					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30		V	I_C = 1.0 mA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0		V	I_E = 100 µA
I_{CEO}	Collector-Emitter Dark Current		100	nA	V_{CE} = 10 V
Coupled					
$V_{CE(SAT)}$	Saturation Voltage		0.40	V	I_C = 125 µA, I_F = 20 mA
$I_{C(ON)}$	On-State Collector Current	250		µA	V_{CE} = 10 V, I_F = 20 mA

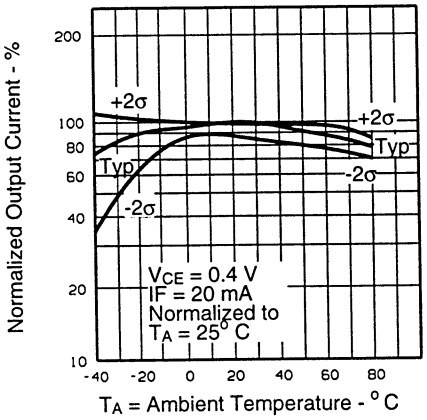
SLOTTED OPTICAL SWITCHES

Typical Performance Curves

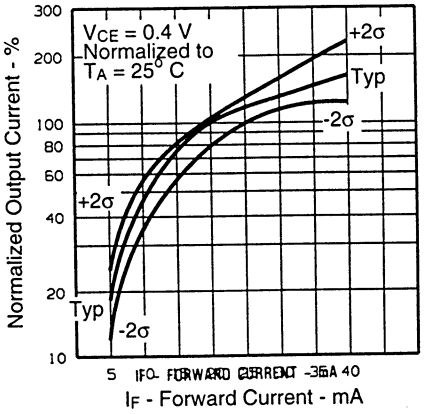
Forward Current vs Forward Voltage Input Diode



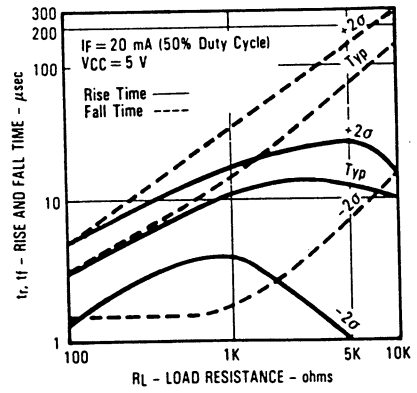
Normalized Output Current vs Ambient Temperature



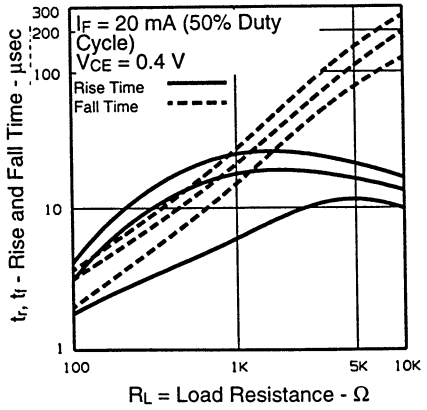
Normalized Output Current vs Forward Current



Rise and Fall Time vs Load Resistance



Rise and Fall Time vs Load Resistance



Relative Output Current vs Time