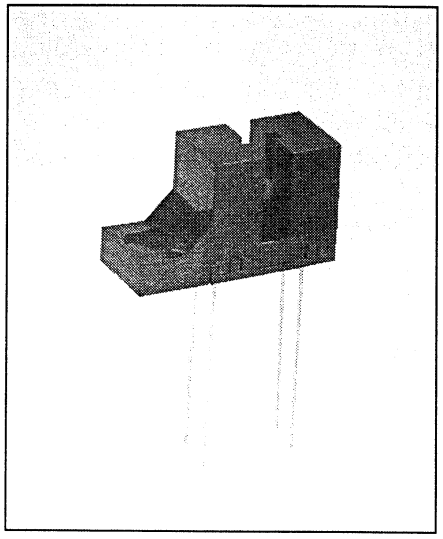
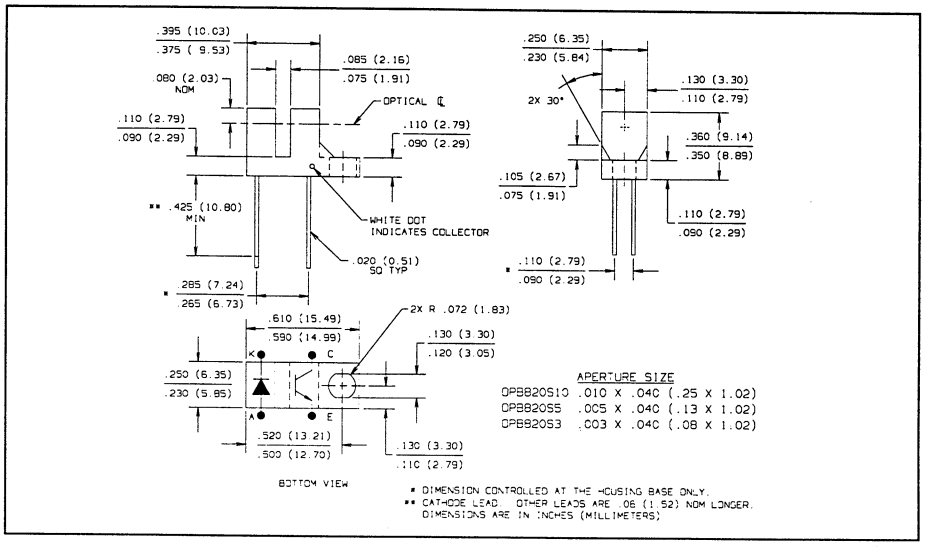
Slotted Optical Switches
Types OPB820, OPB820S10, OPB820S5, OPB820S3





Features

- Non-contact switching
- Three standard aperture sizes for high resolution
- Low profile
- 0.080" (2.03 mm) wide gap
- 0.275" (6.96 mm) lead spacing

Description

The OPB820, OPB820S10, OPB820S5, and OPB820S3 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 0.080" (2.03 mm) wide slot. Phototransistor switching takes place whenever an opaque object passes through the slot. All assemblies have 0.040" (1.02 mm) wide apertures located in front of the infrared diode. For phototransistor side aperture size, see chart below. Available with 4.5" min, 26 AWG wires as OPB821 series.

OPB#	Phototransistor Aperture Width
OPB820	0.040"
OPB820S10	0.010"
OPB820S5	0.005"
OPB820S3	0.003"

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 (1.6mm) from case for 5 sec. with soldering iron] ..... 240° C(1)

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(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) Methanol or isopropanol are recommended as cleaning agents. Plastic housing is soluble in chlorinated hydrocarbons and ketones.
(4) All parameters tested using pulse technique.

Types OPB820, OPB820S10, OPB820S5, OPB820S3

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

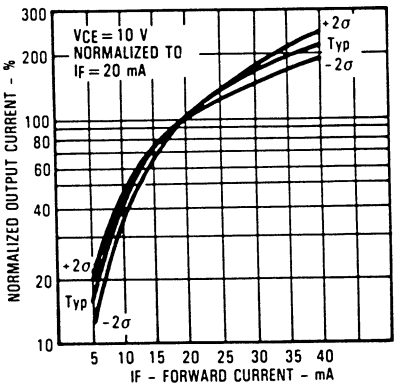
SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode							
V_F	Forward Voltage				1.70	V	I_F = 20 mA
I_R	Reverse Current				100	µA	V_R = 2 V
Output Phototransistor							
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage			30		V	I_C = 1 mA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage			5.0		V	I_E = 100 µA
I_{CEO}	Collector-Emitter Dark Current				100	nA	V_{CE} = 10 V, I_F = 0, I_E = 0
Coupled							
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	OPB820			0.4	V	I_C = 250 µA, I_F = 20 mA
		OPB820S10			0.4	V	I_C = 250 µA, I_F = 20 mA
		OPB820S5			0.4	V	I_C = 125 µA, I_F = 20 mA
		OPB820S3			0.4	V	I_C = 40 µA, I_F = 20 mA
$I_{C(ON)}$	On-State Collector Current	OPB820	500			µA	V_{CE} = 5 V, I_F = 20 mA
		OPB820S10	400			µA	V_{CE} = 5 V, I_F = 20 mA
		OPB820S5	300			µA	V_{CE} = 5 V, I_F = 20 mA
		OPB820S3	60			µA	V_{CE} = 5 V, I_F = 20 mA

SLOTTED OPTICAL SWITCHES

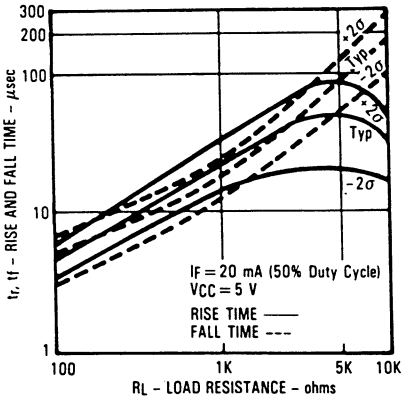
Typical Performance Curves

OPB820S12, OPB820S7, OPB820S5

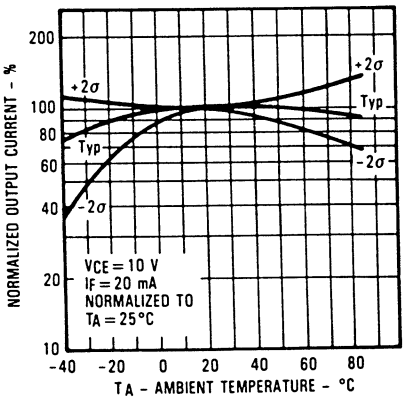
Normalized Output Current vs Input Current



Rise and Fall Time vs Load Resistance

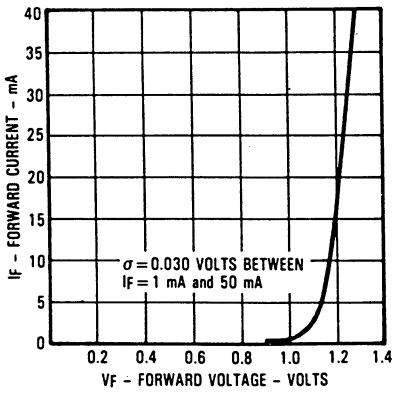


Normalized Output Current vs Ambient Temperature

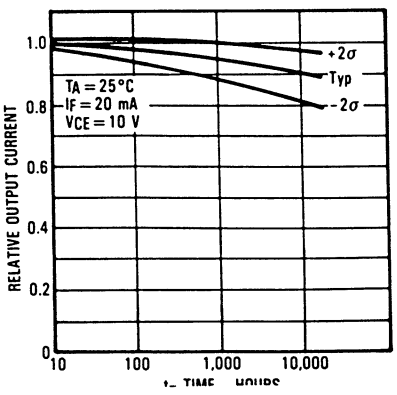


All Assemblies

Forward Current vs Forward Voltage Input Diode



Relative Output Current vs Time



Reduction in Output Current Due to LED Heating vs Forward Current