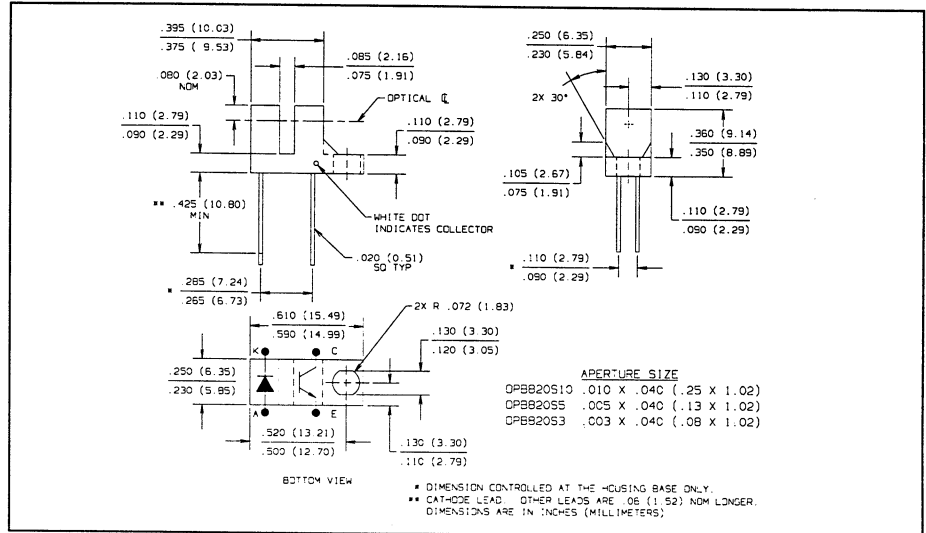
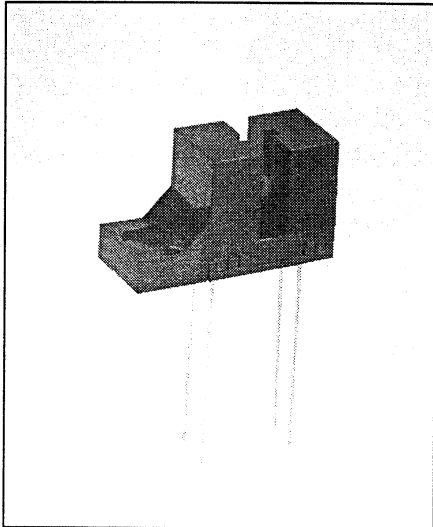


Slotted Optical Switches

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

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

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 $100\text{ mW}^{(2)}$

Output Phototransistor

Collector-Emitter Voltage 30 V
 Emitter-Collector Voltage 5.0 V
 Power Dissipation $100\text{ mW}^{(2)}$

Notes:

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

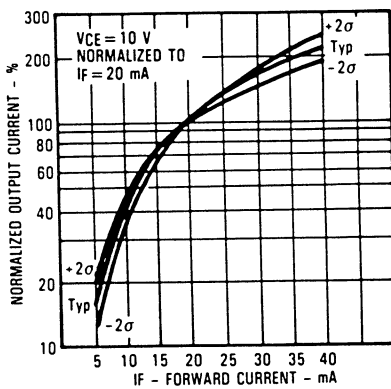
SLOTTED OPTICAL SWITCHES

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

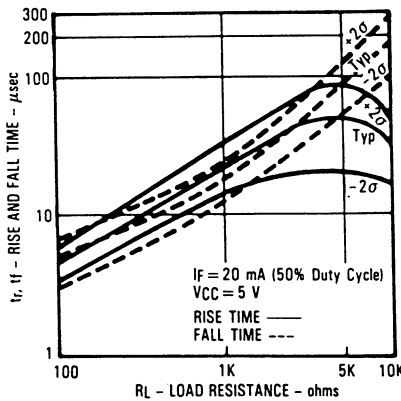
Typical Performance Curves

OPB820S12, OPB820S7, OPB820S5

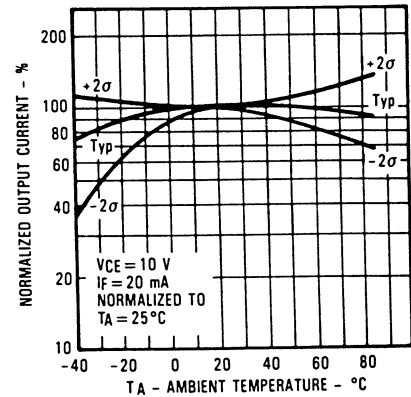
Normalized Output Current vs Input Current



Rise and Fall Time vs Load Resistance

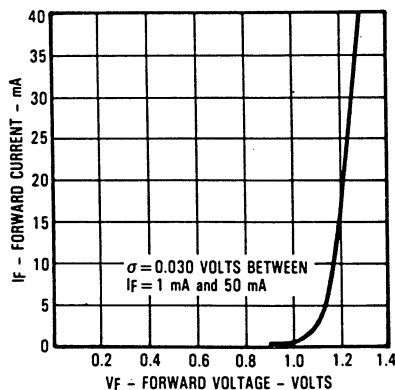


Normalized Output Current vs Ambient Temperature

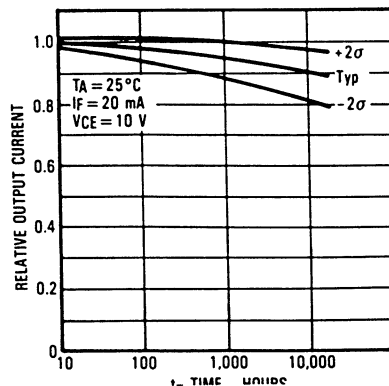


All Assemblies

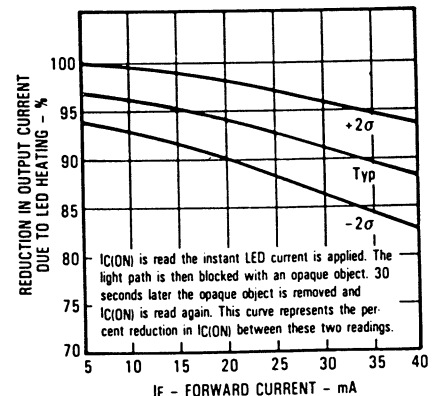
Forward Current vs Forward Voltage Input Diode



Relative Output Current vs Time



Reduction in Output Current Due to LED Heating vs Forward Current



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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