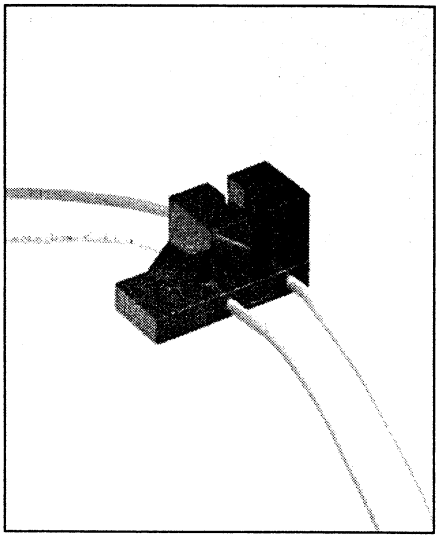
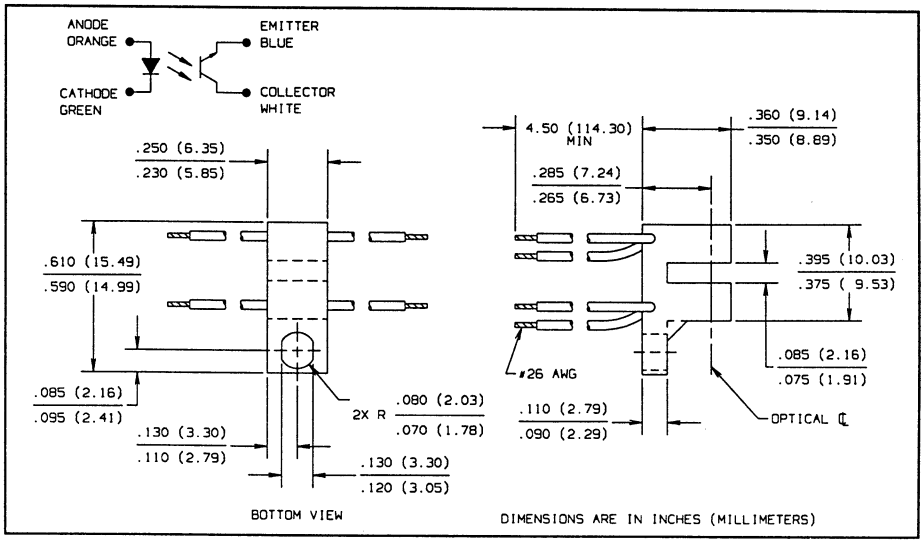
Slotted Optical Switches
Types OPB821, OPB821S10, OPB821S5, OPB821S3





Features

- Three standard aperture sizes for high resolution
- Low profile, 0.080" (2.03 mm) wide slot
- 4.5" min, 26 AWG wire leads
- TX-TXV process available (see Hi-Rel section)

Description

The OPB821series 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. A minimum of 4.5" (114.3 mm) lead wires ease assembly where PC board mounting is not practical. Available with PC board mountable leads as OPB820 series.

OPB#	Phototransistor Aperture Width
OPB821	0.040"
OPB821S10	0.010"
OPB821S5	0.005"
OPB821S3	0.003"

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

Storage and Operating Temperature Range ..... -40° C to +80° C
Lead Soldering Temperature [1/16 inch (1.6 mm) 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 1.82 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 OPB821, OPB821S10, OPB821S5, OPB821S3

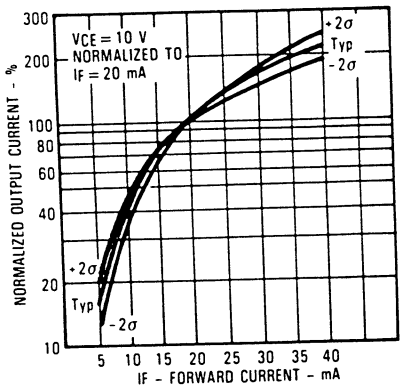
Electrical Characteristics (T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER		MIN	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, E_e = 0
Coupled						
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	OPB821		0.4	V	I_C = 250 µA, I_F = 20 mA
		OPB821S10		0.4	V	I_C = 250 µA, I_F = 20 mA
		OPB821S5		0.4	V	I_C = 125 µA, I_F = 20 mA
		OPB821S3		0.4	V	I_C = 40 µA, I_F = 20 mA
$I_{C(ON)}$	On-State Collector Current	OPB821	500		µA	V_{CE} = 5 V, I_F = 20 mA
		OPB821S10	400		µA	V_{CE} = 5 V, I_F = 20 mA
		OPB821S5	300		µA	V_{CE} = 5 V, I_F = 20 mA
		OPB821S3	60		µA	V_{CE} = 5 V, I_F = 20 mA

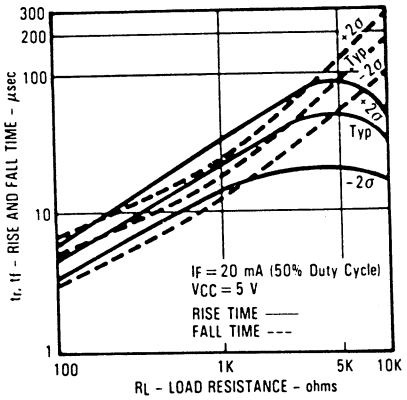
Typical Performance Curves

OPB821, OPB821S10, OPB821S5, OPB821S3

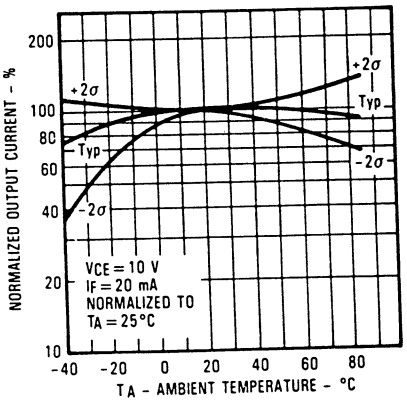
Normalized Output Current vs Input Current



Rise and Fall Time vs Load Resistance

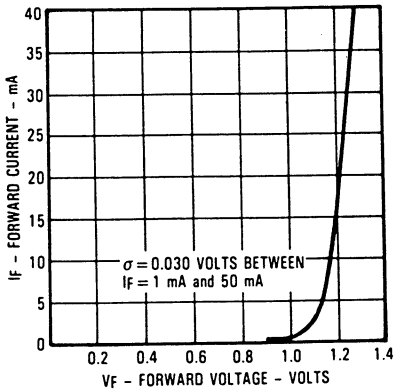


Normalized Output Current vs Ambient Temperature

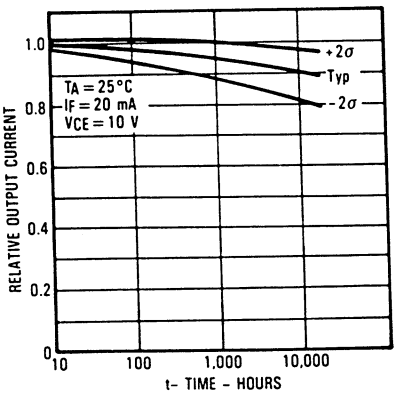


All Assemblies

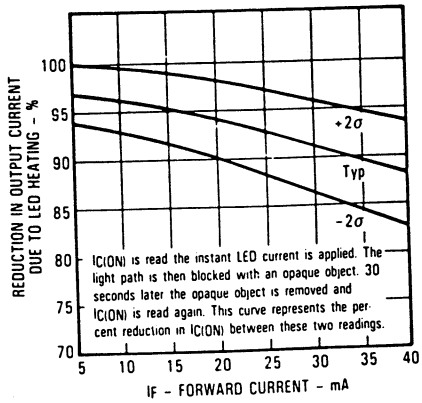
Forward Current vs Forward Voltage Input Diode



Relative Output Current vs Time



Reduction in Output Current Due to LED Heating vs Forward Current



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