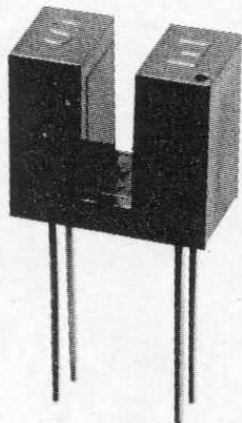
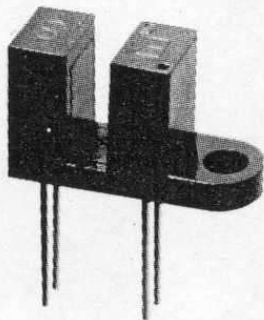


Slotted Optical Switches

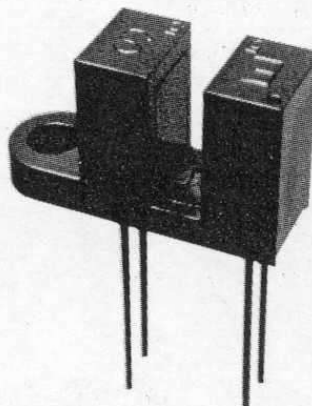
Types OPB860, OPB870 Series



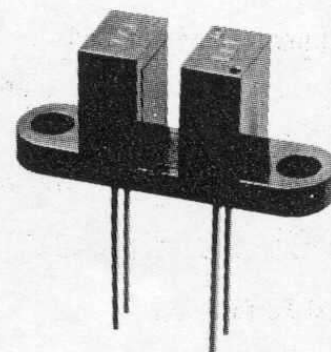
Package N



Package L



Package P



Package T

Features

- 0.125" wide gap
- Choice of aperture
- Choice of opaque or IR transmissive shell material
- Choice of mounting configuration
- Choice of lead spacing

Description

The OPB860/870 series of slotted switches provides the design engineer with the flexibility of a custom device from a standard product line. Building from a standard housing with a .125" wide slot, the user can specify (1) electrical output parameters, (2) mounting tab configuration, (3) choice of lead spacing, (4) discrete shell material, and (5) aperture width.

All housings are an opaque grade of injection-molded plastic to minimize the assembly's sensitivity to ambient radiation, both visible and near-infrared. Discrete shells (exposed only on the parallel faces inside the device throat) are either IR transmissive plastic for applications where aperture contamination may occur or opaque plastic with aperture openings for maximum protection against ambient light.

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 Range [1/16 inch (1.6mm) from case for 5 sec. with soldering iron] $240^\circ\text{C}^{(2)}$

Input Diode

Forward DC Current 50mA
 Peak Forward Current (1 μs pulse width, 300 pps) 3.0A
 Reverse DC Voltage 2.0V
 Power Dissipation $100\text{mW}^{(1)}$

Output Phototransistor

Collector-Emitter Voltage 30V
 Emitter-Collector Voltage 5.0V
 Collector DC Current 30mA
 Power Dissipation $100\text{mW}^{(1)}$

Notes:

- (1) Derate linearly $1.67\text{mW}/^\circ\text{C}$ above 25°C .
- (2) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
- (3) All parameters tested using pulse technique.
- (4) Lead spacing of .220" or .320" is available. Leads are 0.20" sq and .425" long (min).
- (5) Methyl and isopropyl alcohols are recommended as cleaning agents. Plastic housings are soluble in chlorinated hydrocarbons and ketones.

Types OPB860, OPB870 Series

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage			1.7	V	$I_F = 20\text{mA}$
I_R	Reverse Current			100	μA	$V_R = 2.0\text{V}$

Output Phototransistor

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30			V	$I_C = 1.0\text{mA}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0			V	$I_E = 100\mu\text{A}$
I_{CEO}	Collector-Emitter Dark Current			100	nA	$V_{CE} = 10\text{V}, I_F = 0, E_o = 0$

Coupled

$V_{CE(SAT)}$	Saturation Voltage:					
	Parameter A	OPB860 / OPB870 OPB865 / OPB875			0.4	V $I_C = 400\mu\text{A}, I_F = 20\text{mA}$
	Parameter B	OPB861 / OPB871 OPB866 / OPB876			0.4	V $I_C = 800\mu\text{A}, I_F = 10\text{mA}$
	Parameter C	OPB862 / OPB872 OPB867 / OPB877			0.6	V $I_C = 1800\mu\text{A}, I_F = 20\text{mA}$
$I_{C(ON)}$	On-State Collector Current:					
	Parameter A	OPB860 / OPB870 OPB865 / OPB875	500		μA	$V_{CE} = 10\text{V}, I_F = 20\text{mA}$
	Parameter B	OPB861 / OPB871 OPB866 / OPB876	1000		μA	$V_{CE} = 5\text{V}, I_F = 10\text{mA}$
	Parameter C	OPB862 / OPB872 OPB867 / OPB877	1800		μA	$V_{CE} = 0.6\text{V}, I_F = 20\text{mA}$

PART NUMBER GUIDE

OPB 8 X X X X X

Optek Assembly

Phototransistor Output
Family

Discrete Shell Material
Designation

6 - Base Mount IR Transmissive
Plastic Discrete Shell
PC Mountable Leads

7 - Base Mount Opaque
Plastic Discrete Shell
PC Mountable Leads

Aperture Width In Front
of Sensor
5 = 0.050" 1 = 0.010"

Aperture Width In Front
of Emitter
5 = 0.050" 1 = 0.010"

Mounting Configurations

T - Both Mounting Tabs
N - No Mounting Tabs
L - Single Mounting Tab
Emitter Side
P - Single Mounting Tab
Phototransistor Side

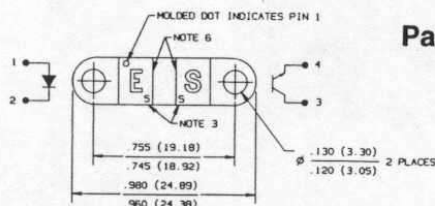
Electrical Specification Variations

- 0 - Electrical Parameter A, Lead Spacing 0.320"
- 1 - Electrical Parameter B, Lead Spacing 0.320"
- 2 - Electrical Parameter C, Lead Spacing 0.320"
- 5 - Electrical Parameter A, Lead Spacing 0.220"
- 6 - Electrical Parameter B, Lead Spacing 0.220"
- 7 - Electrical Parameter C, Lead Spacing 0.220"

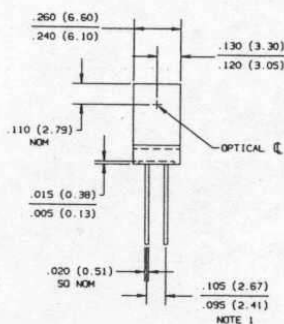
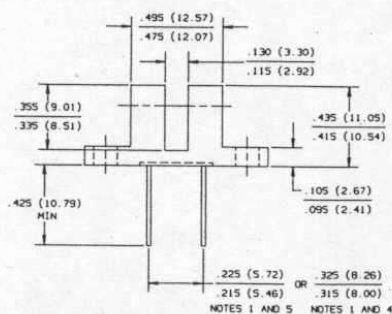
*Assemblies with dual 0.010" apertures are currently
available with electrical parameter "A" only.

TX-TXV Process

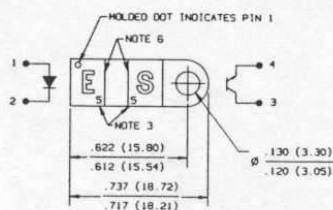
Available
See Hi-Rel
Section



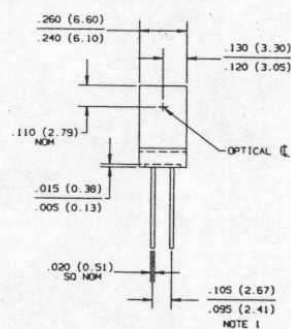
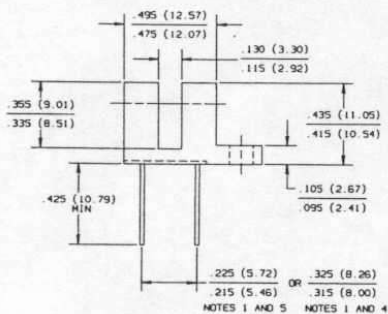
Package Configuration T



DIMENSIONS ARE IN INCHES (MILLIMETERS)

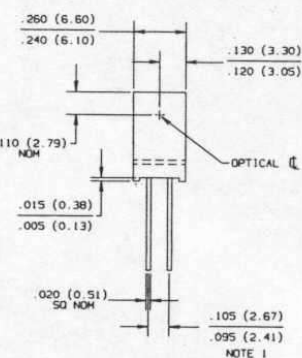
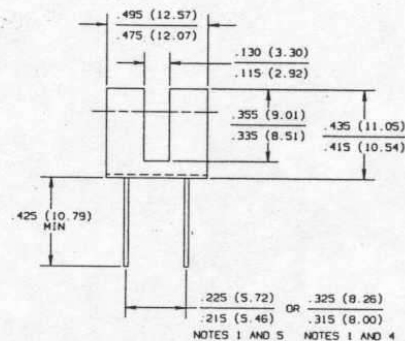
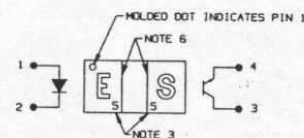


Package Configuration P

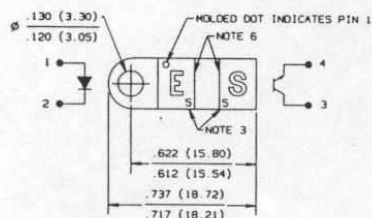


DIMENSIONS ARE IN INCHES (MILLIMETERS)

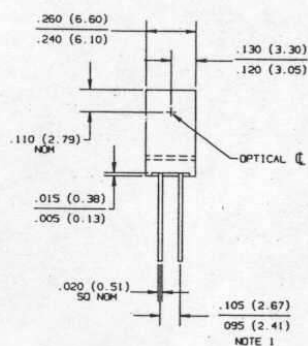
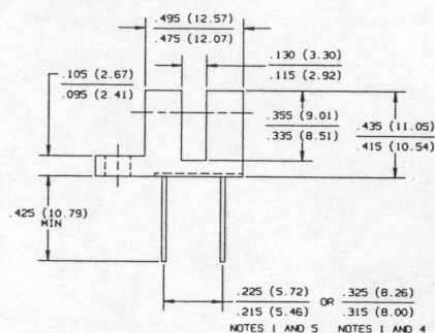
Package Configuration N



DIMENSIONS ARE IN INCHES (MILLIMETERS)



Package Configuration L



DIMENSIONS ARE IN INCHES (MILLIMETERS)

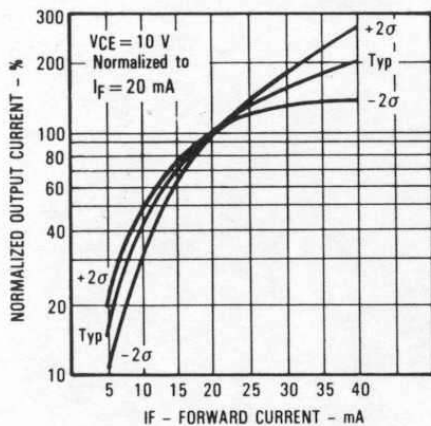
Notes:

- (1) Dimension controlled at housing surface only.
- (2) Methanol and isopropanol alcohols are recommended as cleaning agents. Housings are soluble in chlorinated hydrocarbons and ketones. Highly activated, water soluble fluxes may attack housings in some situations.
- (3) Molded number to identify aperture size. See part number guide.
- (4) OPB860, OPB861, OPB862, OPB870, OPB871, OPB872.
- (5) OPB865, OPB866, OPB867, OPB875, OPB876, OPB877.
- (6) Dimensions of aperture opening dependent on housing. See part number guide.

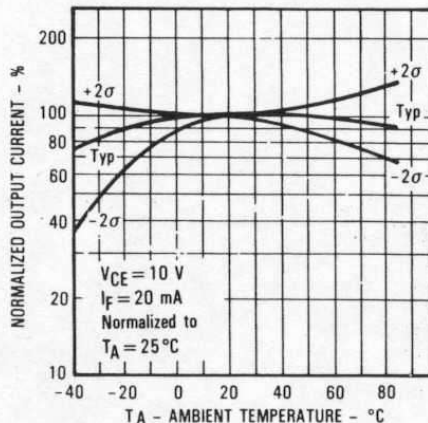
Types OPB860, OPB870 Series

Typical Performance Curves

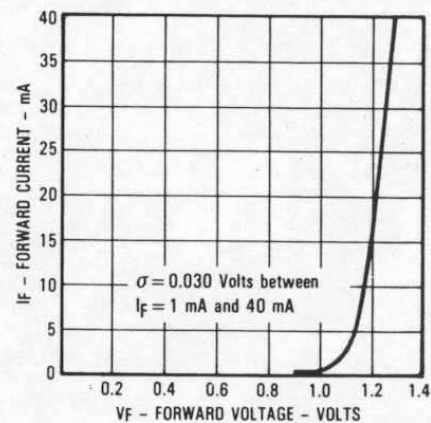
Normalized Output Current vs Forward Current



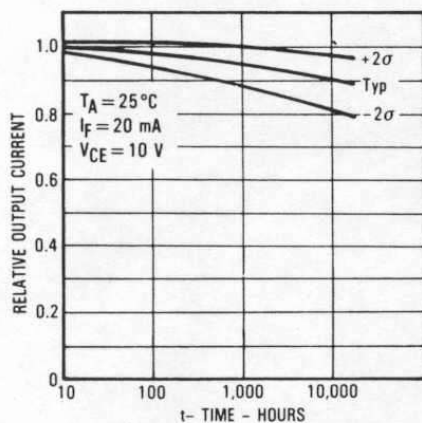
Normalized Output Current vs Ambient Temperature



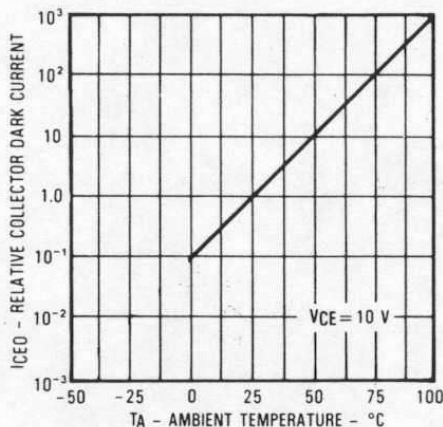
Forward Current vs Forward Voltage Input Diode



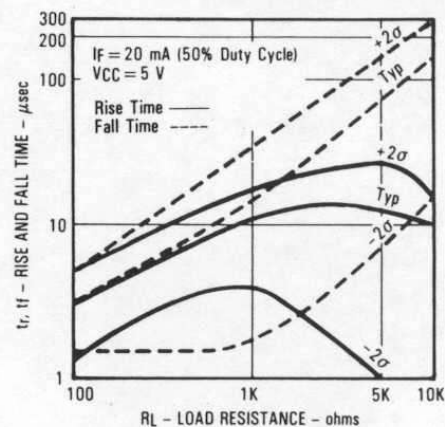
Relative Output Current vs Time



Collector Dark Current vs Ambient Temperature

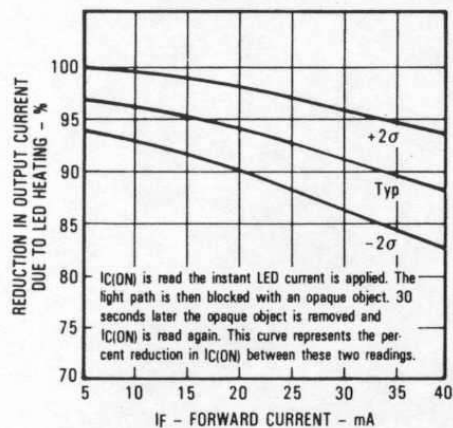


Rise and Fall Time vs Load Resistance

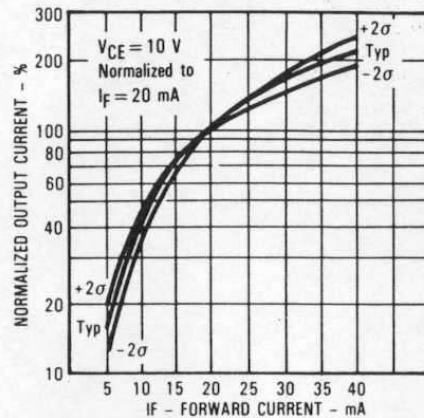


All Part Numbers Ending in "1"

Reduction in Output Current Due to LED Heating vs Forward Current



Normalized Output Current vs Input Current



Rise and Fall Time vs Load Resistance

