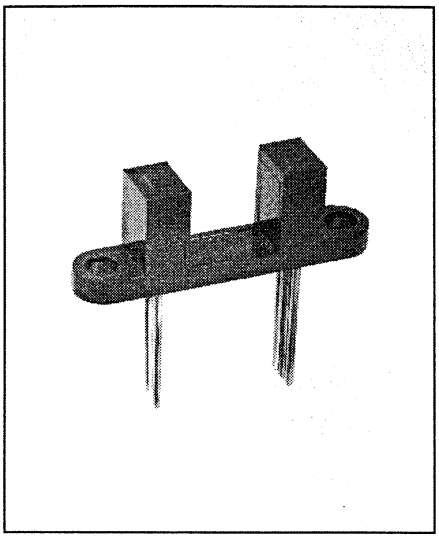
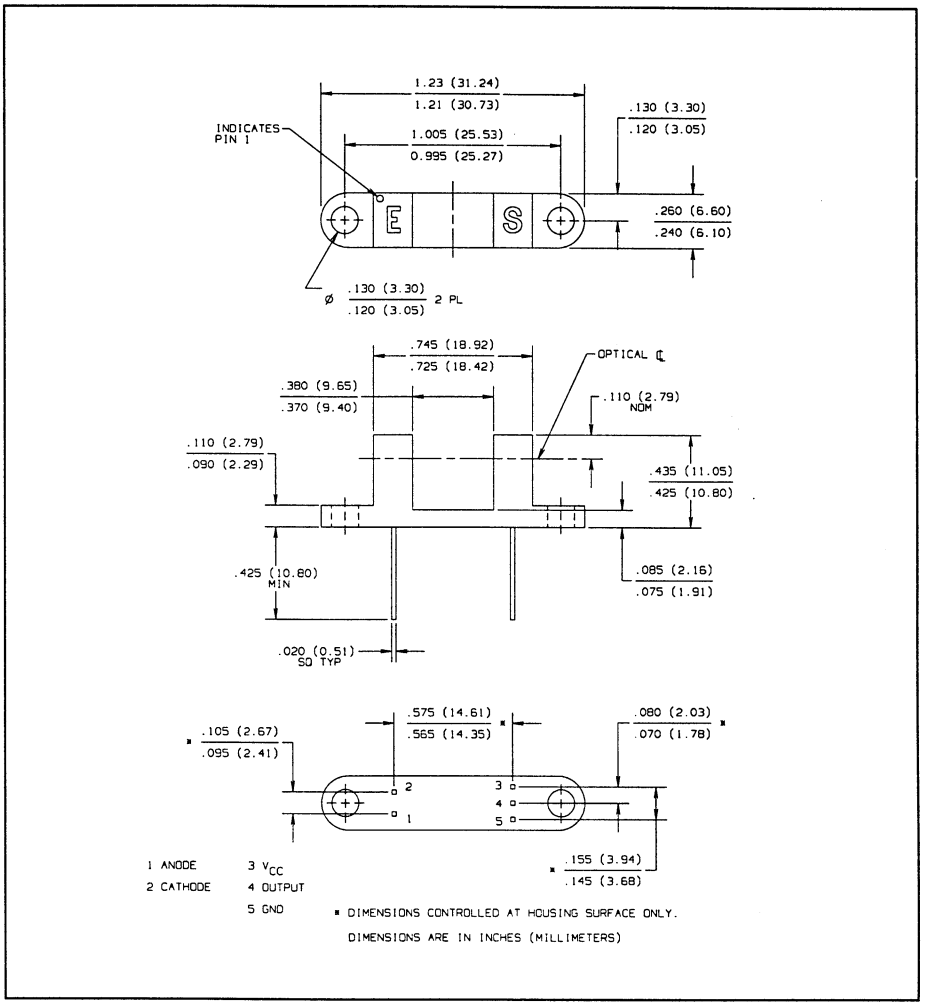
Photologic® Slotted Optical Switches
Types OPB900L, OPB910L "Wide Gap" Series





Features

- 0.375" (9.53 mm) wide gap
- Choice of output configuration
- Choice of opaque or IR transmissive shell material
- Data rates to 250 kBaud
- 0.570" (14.48 mm) lead spacing

Description

The OPB900L and OPB910L series of Photologic® Photo Integrated Circuit Switches provide optimum flexibility for the design engineer. Building from a standard housing with a 0.375" (9.53 mm) wide slot, the user can specify (1) type and polarity of TTL output and (2) discrete shell material. Available with wire leads as OPB900W/OPB910W series.

The electrical output can be specified as either TTL totem pole or TTL open collector. Either may be supplied with inverter or buffer output polarity. All have added stability of a built-in hysteresis amplifier.

RoHS

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

Supply Voltage, V_{CC} (Not to exceed 3 sec.)	10 V
Storage Temperature Range	-40° C to +85° C
Operating Temperature Range	-40° C to +70° C
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron]	240° C(1)
Input Diode Power Dissipation	100 mW(2)
Output Photologic® Power Dissipation	200 mW(3)
Total Device Power Dissipation	300 mW(4)
Voltage at Output Lead (Open Collector Output)	35 V
Diode Forward D.C. Current	40 mA
Diode Reverse D.C. Voltage	2 V

Notes:

(1) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
(2) Derate linearly 2.22 mW/° C above 25° C.
(3) Derate linearly 4.44 mW/° C above 25° C.
(4) Derate linearly 6.66 mW/° C above 25° C.
(5) The OPB900L/OPB910L series are terminated with 0.020" square leads designed for printed circuit board mounting.
(6) Normal application would be with light source blocked, simulated by I_F = 0 mA.
(7) All parameters tested using pulse technique.
(8) Methanol or isopropanol are recommended as cleaning agents. Plastic housings are soluble in chlorinated hydrocabons and ketones.

Types OPB900L, OPB910L Series

Electrical Characteristics (T_A = -40° C to +70° C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage			1.7	V	I_F = 20 mA, T_A = 25° C
I_R	Reverse Current			100	µA	V_R = 2 V, T_A = 25° C
Output Photologic® Sensor						
V_{CC}	Operating D.C. Supply Voltage	4.75		5.25	V	
I_{CCL}	Low Level Supply Current: Buffered Totem-Pole Output Buffered Open-Collector Output			15	mA	V_{CC} = 5.25 V, I_F = 0 mA(6)
	Inverted Totem-Pole Output Inverted Open-Collector Output			15	mA	V_{CC} = 5.25 V, I_F = 20 mA
I_{CCH}	High Level Supply Current: Buffered Totem-Pole Output Buffered Open-Collector Output			15	mA	V_{CC} = 5.25 V, I_F = 20 mA
	Inverted Totem-Pole Output Inverted Open-Collector Output			15	mA	V_{CC} = 5.25 V, I_F = 0 mA(6)
V_{OL}	Low Level Output Voltage: Buffered Totem-Pole Output Buffered Open-Collector Output			0.4	V	V_{CC} = 4.75 V, I_{OL} = 12.8 mA I_F = 0 mA(6)
	Inverted Totem-Pole Output Inverted Open-Collector Output			0.4	V	V_{CC} = 4.75 V, I_{OL} = 12.8 mA I_F = 20 mA
V_{OH}	High Level Output Voltage: Buffered Totem-Pole Output	2.4			V	V_{CC} = 4.75 V, I_{OH} = -800 µA I_F = 20 mA
	Inverted Totem-Pole Output	2.4			V	V_{CC} = 4.75V, I_{OH} = -800 µA I_F = 0 mA(6)
I_{OH}	High Level Output Current: Buffered Open-Collector Output			100	µA	V_{CC} = 4.75 V, V_{OH} = 30 V I_F = 20 mA, T_A = 25° C
	Inverted Open-Collector Output			100	µA	V_{CC} = 4.75 V, V_{OH} = 30 V I_F = 0 mA, T_A = 25° C
$I_{F(+)}$	LED Positive-Going Threshold Current			20	mA	V_{CC} = 5 V, T_A = 25° C
$I_{F(+)}/I_{F(-)}$	Hysteresis		2.0			V_{CC} = 5 V
I_{OS}	Short Circuit Output Current: Buffered Totem-Pole Output	-30		-100	mA	V_{CC} = 5.25 V, I_F = 20 mA Output = GND
	Inverted Totem-Pole Output	-30		-100	mA	V_{CC} = 5.25 V, I_F = 0 mA Output = GND
t_r,t_f	Output Rise Time, Output Fall Time		70		ns	V_{CC} = 5 V, T_A = 25° C I_F = 0 or 20 mA R_L = 8 TTL Loads (Totem-Pole) R_L = 360 Ω (Open-Collector)
t_{PLH}, t_{PHL}	Propagation Delay Low-High & High Low		5.0		µs	

Housing

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 on the parallel faces inside the device throat) are either IR transmissive plastic for applications where aperture contamination may occur or opaque plastic for maximum protection against ambient light.

Optek reserves the right to make changes at any time in order to improve design and to supply the best product possible.
Optek Technology, Inc. 1215 W. Crosby Road Carrollton, Texas 75006 (972)323-2200 Fax (972)323-2396

PART NUMBER GUIDE

OPB 9 X X X X X

Optek Assembly

Photologic®
Photo Integrated Circuit
Sensor Family

Discrete Shell Material
Designation

0 - Wide Gap IR Transmissive
Plastic Discrete Shell

1 - Wide Gap Opaque
Plastic Discrete Shell

Aperture Width In Front
of Sensor
5 = 0.050"

Aperture Width In Front
of Emitter
5 = 0.050"

Mounting Configurations

L - Solder Leads Termination
W - Wire Termination

Electrical Specification Variations

0 - Buffered Totem-Pole Output

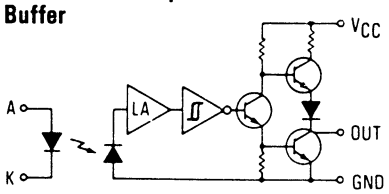
1 - Buffered Open-Collector Output

2 - Inverted Totem-Pole Output

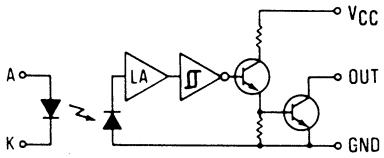
3 - Inverted Open-Collector Output

Schematics

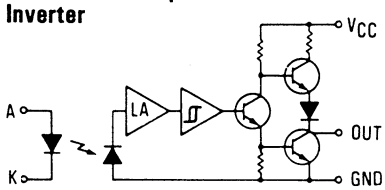
OPB900/OPB910
(Totem-Pole Output)
Buffer



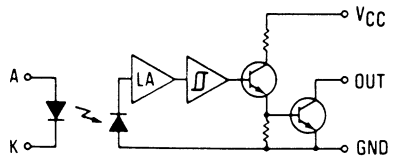
OPB901/OPB911
(Open-Collector Output)
Buffer



OPB902/OPB912
(Totem-Pole Output)
Inverter



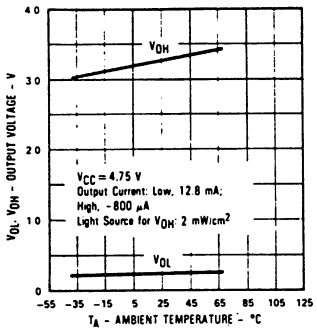
OPB903/OPB913
(Open-Collector Output)
Inverter



Types OPB900L, OPB910L Series

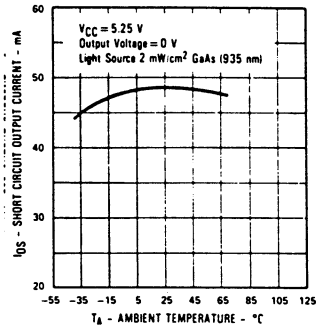
Typical Performance Curves

Output Voltage vs Ambient Temperature



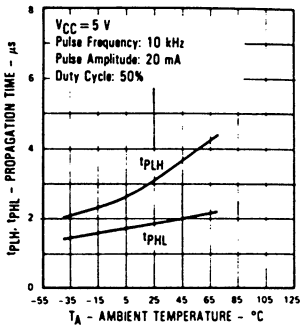
OPB900L, OPB902L, OPB910L, OPB912L

Short Circuit Output Current vs Ambient Temperature



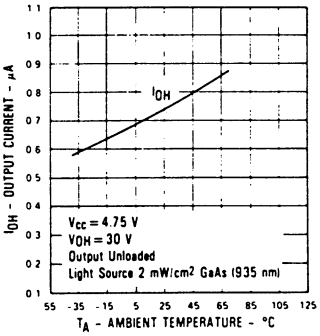
All Assemblies

Propagation Time vs Ambient Temperature

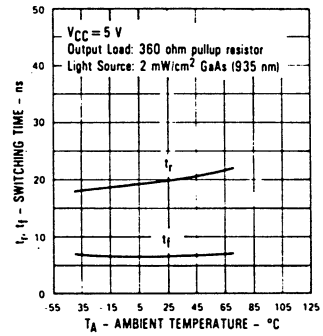


OPB901L, OPB903L, OPB911L, OPB913L

Output Current (High) vs Ambient Temperature

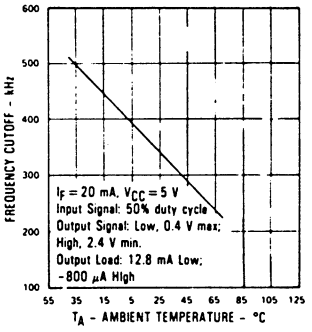


Rise Time and Fall Time vs Ambient Temperature



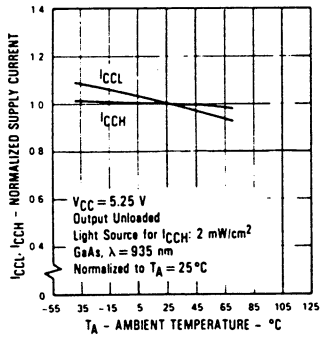
All Assemblies

Data Rate vs Ambient Temperature



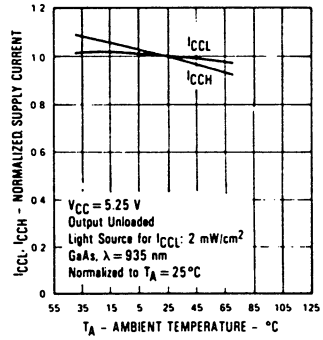
OPB902L, OPB903L, OPB912L, OPB913L

Normalized Supply Current vs Ambient Temperature



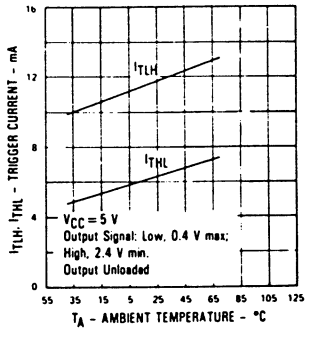
OPB900L, OPB901L, OPB910L, OPB911L

Normalized Supply Current vs Ambient Temperature

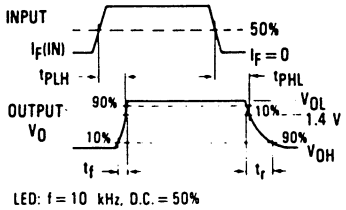


All Assemblies

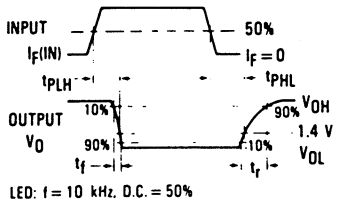
Trigger Current vs Ambient Temperature



Switching Test Curve for Buffers



Switching Test Curve for Inverters



Optek reserves the right to make changes at any time in order to improve design and to supply the best product possible.