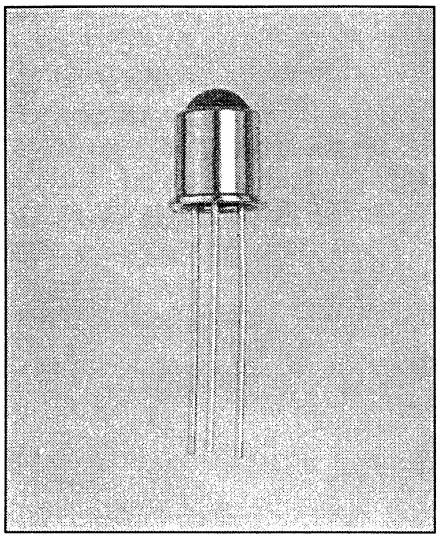
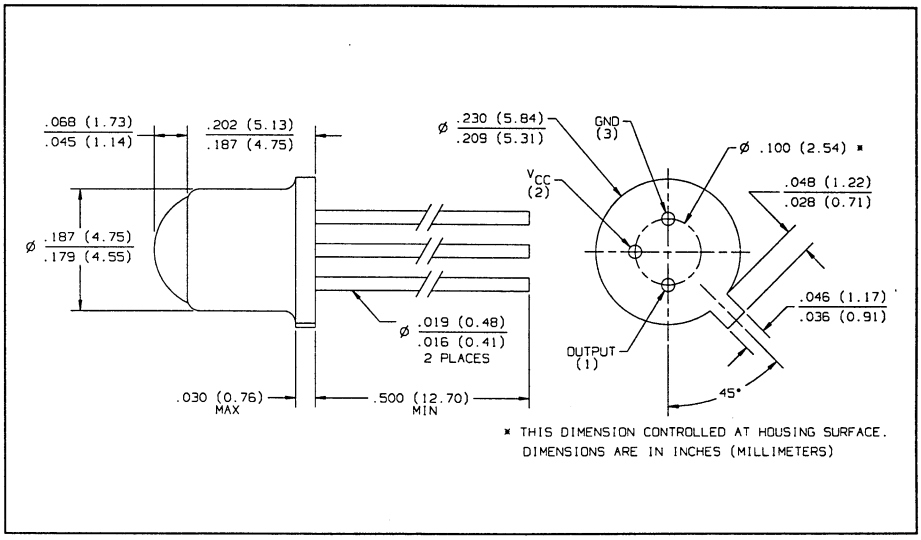
Photologic® Hermetic Sensors
Types OPL800, OPL801 Series





Features

- Four output options
- High noise immunity
- Direct TTL/LSTTL interface
- TO-18 hermetic package
- Mechanically and spectrally matched to OP130 and OP231 series LEDs
- Data rates to 250 kBaud
- TX-TXV process available (see Hi-Rel section)

Description

The OPL800, OPL800-OC, OPL801, and OPL801-OC each incorporate a photodiode, a linear amplifier, and a Schmitt trigger on a single silicon chip. The devices feature TTL/LSTTL compatible logic level output which can drive up to 8 TTL loads without additional circuitry. Also featured are medium speed data rates to 250 kBaud with typical rise and fall times of 25 nsec. The Schmitt trigger's hysteresis characteristics provide high immunity to noise on input and V_{CC}. The Photologic® chip is mounted on a standard TO-18 header which is hermetically sealed in a lensed metal can. These devices are mechanically and spectrally matched to OP130 and OP230 infrared emitting diodes.

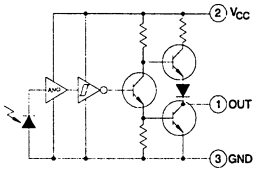
Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Supply Voltage, V_{CC} (not to exceed 3 seconds)	+10 V
Storage Temperature Range	-65° C to +150° C
Operating Temperature Range	-55° C to +110° C
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron]	260° C(1)
Power Dissipation	120 mW(2)
Duration of Output Short to V_{CC} or Ground (OPL800, OPL801)	1.00 sec.
Duration of Output Short to V_{CC} (OPL800-OC, OPL801-OC)	1.00 sec.
Voltage at Output Lead (OPL800-OC, OPL801-OC)	35 V
Irradiance	3 mW/cm²

Notes:
(1) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering. Max. 20 grams force may be applied to leads when soldering.
(2) Derate linearly 3.4 mW/° C above 90° C.
(3) Light measurements are made with λ = 935 nm.

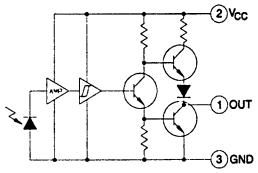
Schematic

OPL800 (Totem-Pole Output) Buffer



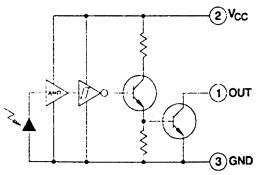
Light On - Output High

OPL801 (Totem-Pole Output) Inverter



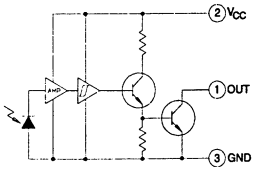
Light On - Output Low

OPL800-OC (Open-Collector Output) Buffer



Light On - Output High

OPL801-OC (Open-Collector Output) Inverter



Light On - Output Low

Types OPL800, OPL801 Series

Electrical Characteristics (-40° C to +100° C unless otherwise noted)

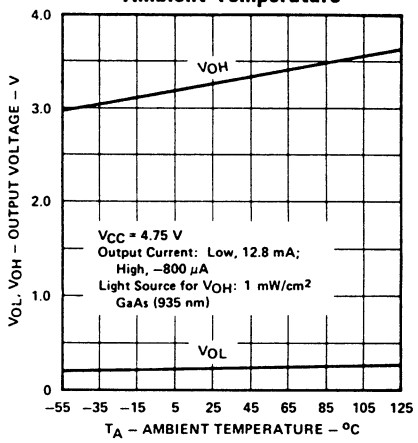
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
V_{CC}	Operating Supply Voltage	4.5		5.5	V	
	Peak-to-Peak V_{CC} Ripple Necessary to Cause False Triggering of Output		2.0		V	V_{CC} = 5 VDC f = DC to 50 MHz
$E_{eT}(+)$	Positive-Going Threshold Irradiance	0.05	0.18	0.60	mW/cm^2	V_{CC} = 5 V, T_A = 25° C(3)
$E_{eT}(+)/E_{eT}(-)$	Hysteresis Ratio	1.5	2.0	2.5		
I_{CC}	Supply Current			15	mA	V_{CC} = 5.5 V, E_e = 0 or 1 mW/cm^2
OPL800 (Buffer, Totem-Pole)						
V_{OH}	High Level Output Voltage	2.4			V	V_{CC} = 4.5 V, I_{OH} = -800 µA, E_e = 1 mW/cm^2
V_{OL}	Low Level Output Voltage			0.40	V	V_{CC} = 4.5 V, I_{OL} = 12.8 mA, E_e = 0
I_{OS}	Short Circuit Output Current	-20		-100	mA	V_{CC} = 5.5 V, E_e = 1 mW/cm^2, Output = GND
OPL800-OC (Buffer, Open-Collector)						
I_{OH}	High Level Output Current			100	µA	V_{CC} = 4.5 V, V_{OH} = 30 V, E_e = 2 mW/cm^2
V_{OL}	Low Level Output Voltage			0.40	V	V_{CC} = 4.5 V, I_{OL} = 12.8 mA, E_e = 0
OPL801 (Inverter, Totem-Pole)						
V_{OH}	High Level Output Voltage	2.4			V	V_{CC} = 4.5 V, I_{OH} = -800 µA, E_e = 0
V_{OL}	Low Level Output Current			0.40	V	V_{CC} = 4.5 V, I_{OL} = 12.8 mA, E_e = 1 mW/cm^2
I_{OS}	Short Circuit Output Current	-20		-100	mA	V_{CC} = 5.5 V, E_e = 0, Output = GND
OPL801-OC (Inverter, Open-Collector)						
I_{OH}	High Level Output Current			100	µA	V_{CC} = 4.5 V, V_{OH} = 30 V, E_e = 0
V_{OL}	Low Level Output Voltage			0.40	V	V_{CC} = 4.5 V, I_{OL} = 12.8 mA, E_e = 1 mW/cm^2
OPL800, OPL801						
t_r, t_f	Output Rise Time, Output Fall Time		70		ns	V_{CC} = 5 V, T_A = 25° C, E_e = 0 or 1 mW/cm^2 f = 10 kHz, D.C. = 50%, R_L = 8 TTL Loads
t_{PLH}, t_{PHL}	Propagation Delay, Low-High, High-Low		5.0		µs	
OPL800-OC, OPL801-OC						
t_r, t_f	Output Rise Time, Output Fall Time		70		ns	V_{CC} = 5 V, T_A = 25° C, E_e = 0 or 1 mW/cm2 f = 10 kHz, D.C. = 50%, R_L = 360 Ω
t_{PLH}, t_{PHL}	Propagation Delay, Low-High, High-Low		5.0		µs	

PHOTOLOGIC® SENSORS

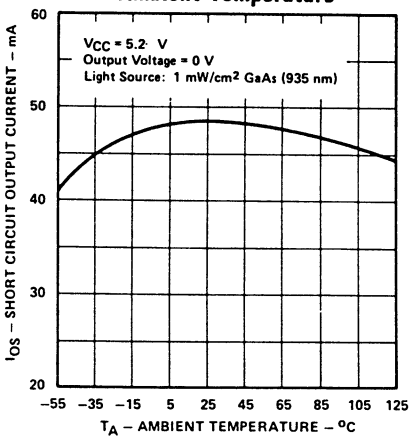
Typical Performance Curves

OPL800, OPL801

Output Voltage vs. Ambient Temperature

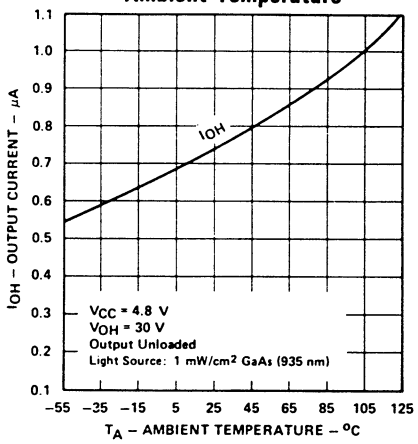


Short Circuit Output Current vs. Ambient Temperature

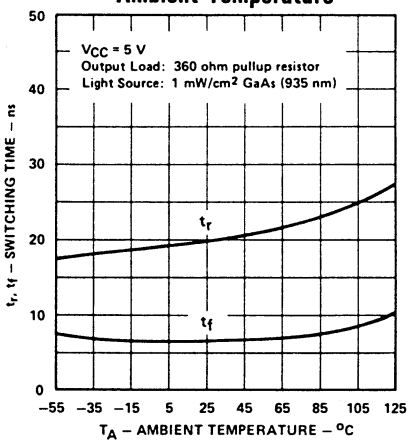


OPL800-OC, OPL801-OC

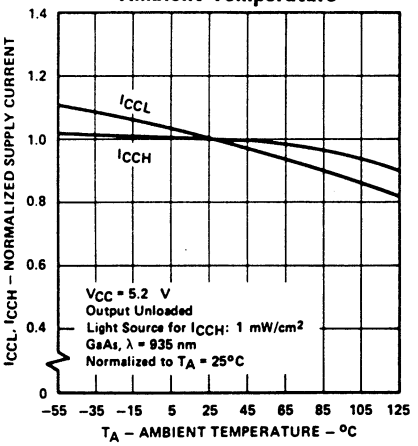
Output Current (High) vs. Ambient Temperature



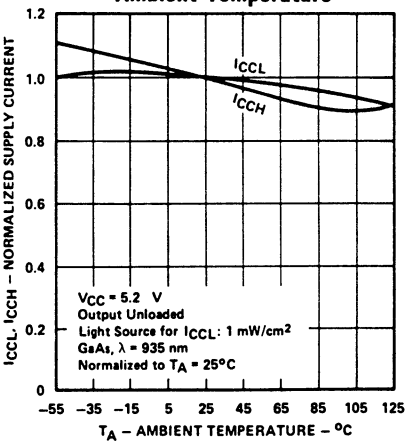
Rise Time and Fall Time vs. Ambient Temperature



OPL800, OPL800-OC Normalized Supply Current vs. Ambient Temperature

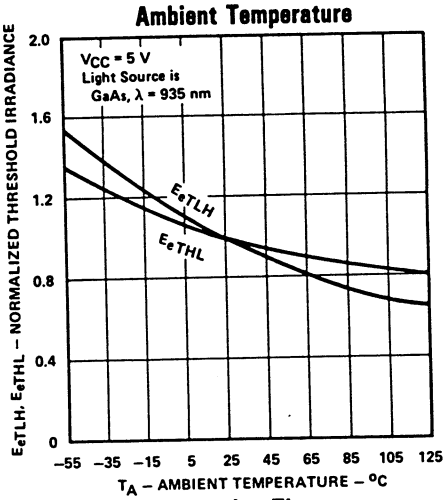


OPL801, OPL801-OC Normalized Supply Current vs. Ambient Temperature

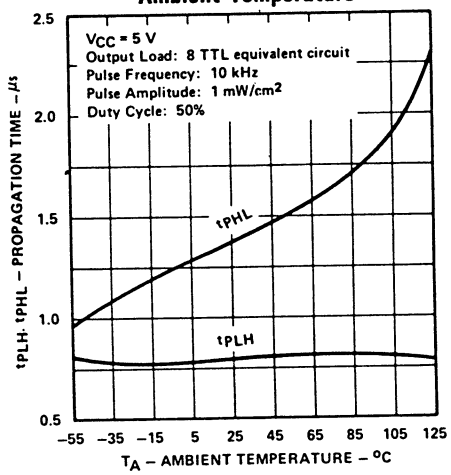


Typical Performance Curves

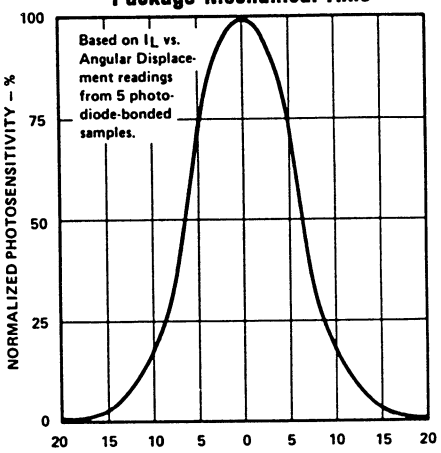
Normalized Threshold Irradiance vs. Ambient Temperature



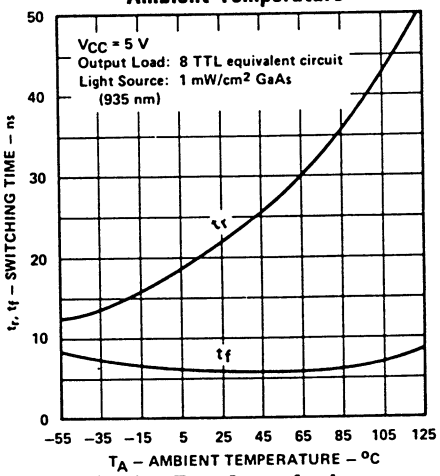
Propagation Time vs. Ambient Temperature



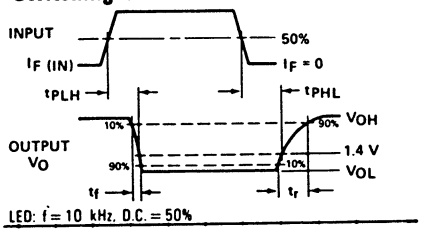
Angular Displacement from Package Mechanical Axis



Rise Time and Fall Time vs. Ambient Temperature

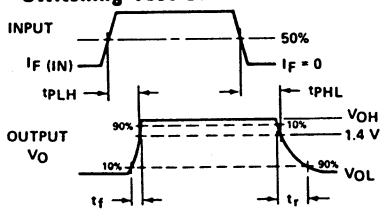


Switching Test Curve for Inverters



LED: f = 10 kHz, D.C. = 50%

Switching Test Curve for Buffers



ICCL, ICCH – NORMALIZED SUPPLY CURRENT

LED: f = 10 kHz, D.C. = 50%

PHOTOLOGIC® SENSORS