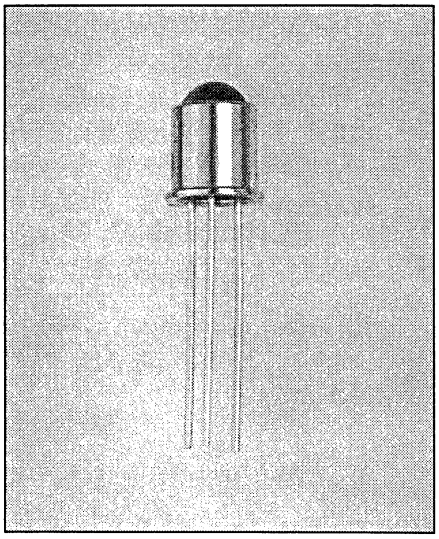
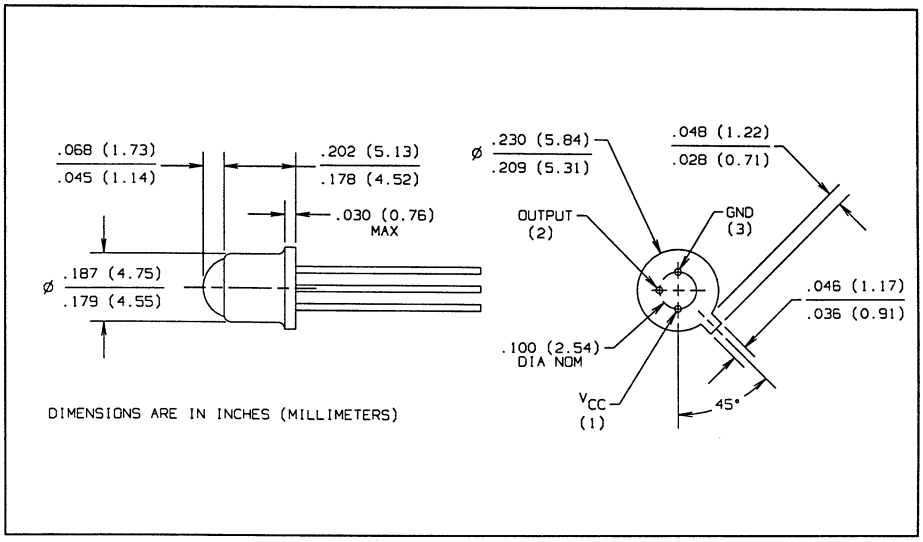
Photologic® Hermetic Sensor
Types OPL820, OPL821 Series





Features

- High sensitivity
- Built in voltage regulator
- Direct TTL/LSTTL interface
- TO-18 hermetic package
- Mechanically and spectrally matched to OP130 and OP231 series LED's
- Data rate to 200 kBaud

Description

The OPL820, OPL820-OC, OPL821, and OPL821-OC consist of a photodiode, a linear amplifier, and a Schmitt trigger on a single monolithic silicon chip. The output is an NPN transistor with either a 10k pull-up resistor to V_{CC} or an open collector (-OC versions). The output polarity is either a buffer (OPL820 versions, output is high when the detector illuminated) or an inverter (OPL821 versions, output is low when the detector is illuminated). The package is a standard glass lensed hermetic TO-18. The output is capable of directly driving 10 TTL loads.

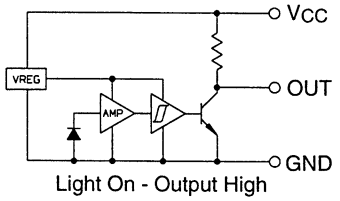
Absolute Maximum Ratings (T_A = 25° C unless otherwise noted.)

Supply Voltage	18 V
Storage Temperature Range	-55° C to +125° C
Operating Temperature Range	-40° C to +100° C
Lead Soldering Temperature	240° C
Power Dissipation	200 mW(2)
Duration of Output Short to V_{CC}	1 sec.
Output Voltage (High State)	30 V
Output Current Sink (Low State)	16 mA

Notes:
(1) RMA flux is recommended. Soldering time may be extended to 10 seconds when flow soldering. Max. 20 grams of force may be applied to leads while at soldering temperatures.
(2) Derate linearly 5.7 mW/° C above 90° C.
(3) Light measurements are made with an LED source having a wavelength of 935 nm.

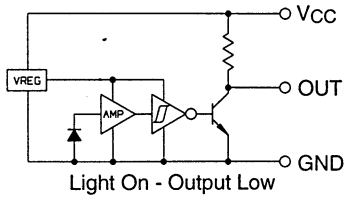
Schematic

OPL820 Buffer/10KΩ PU



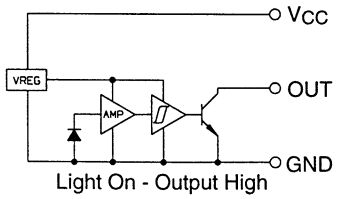
Light On - Output High

OPL821 Inverter/10KΩ PU



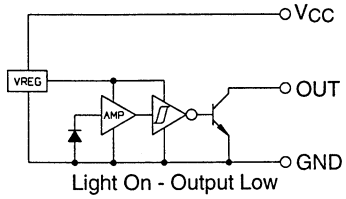
Light On - Output Low

OPL820-OC Buffer/OC



Light On - Output High

OPL821-OC Inverter/OC



Light On - Output Low

Types OPL820, OPL821 Series

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

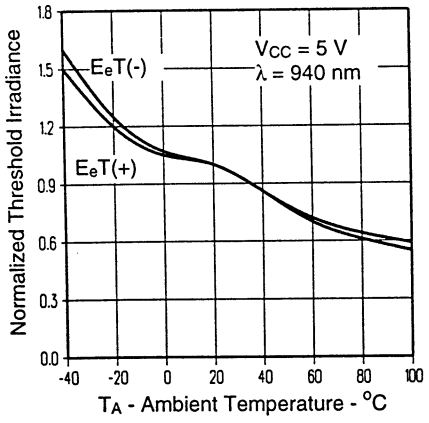
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
V_{CC}	Operating Supply Voltage	4.5		16.0	V	
$E_{eT}(+)$	Positive Going Threshold Irradiance	0.002	0.015	0.035	mW/cm^2	See Note 3
$E_e(+)/E_e(-)$	Hysteresis Ratio	1.05	1.20	1.60		See Note 3
I_{CCH}	High State Supply Current		5.0	12.0	mA	Note 4
I_{CCL}	Low State Supply Current		4.0	12.0	mA	Note 5
V_{OH}	High State Output VoltageOPL820 OPL821	V_{CC}-1.5		V_{CC}	V	I_{OH} = -100 µA, Note 4
V_{OL}	Low State Output Voltage			0.4	V	I_{OL} = 16 mA, Note 5
I_{OH}	High State Output CurrentOPL820-OC OPL821-OC			100	µA	V_{OH} = 30 V, Note 4
t_r, t_f	Output Rise Time, Output Fall Time		60		ns	R_L = 390 Ω
t_{PLH}	Propogation Delay Low to High State		1.0		µs	R_L = 390 Ω, E_e = 0.1 mW/cm^2
t_{PHL}	Propogation Delay High to Low State		2.1		µs	R_L = 390 Ω, E_e = 0.1 mW/cm^2
Data Rate	Data Rate Using NRZ Format		100		kHz	R_L = 390 Ω, E_e = 0.1 mW/cm^2

(4) High output state limits are valid for 4.5 V < V_{CC} < 16 V and E_e > 0.035 mW/cm^2 (OPL820, OPL820-OC), E_e < 0.001 mW/cm^2 (OPL821, OPL821-OC).
(5) Low output state limits are valid for 4.5 V < V_{CC} < 16 V and E_e > 0.035 mW/cm^2 (OPL821, OPL821-OC), E_e < 0.001 mW/cm^2 (OPL820, OPL820-OC).

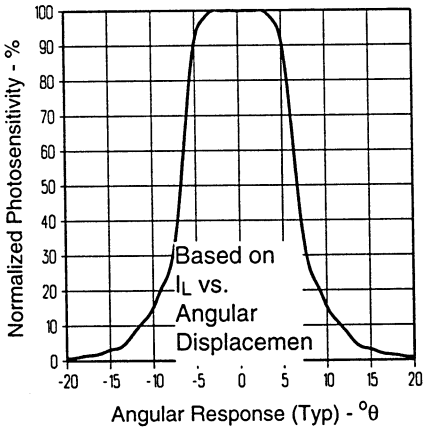
PHOTOLOGIC® SENSORS

Typical Performance Curves

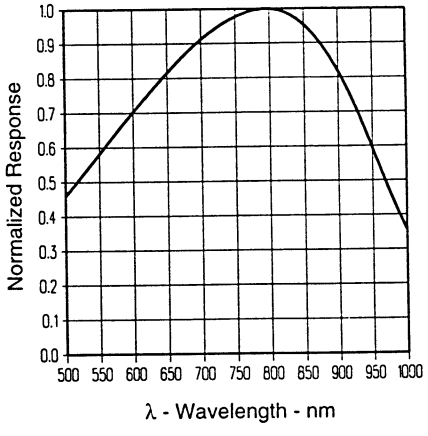
Normalized Threshold Irradiance vs. Ambient Temperature



Angular Displacement From Package Mechanical Axis

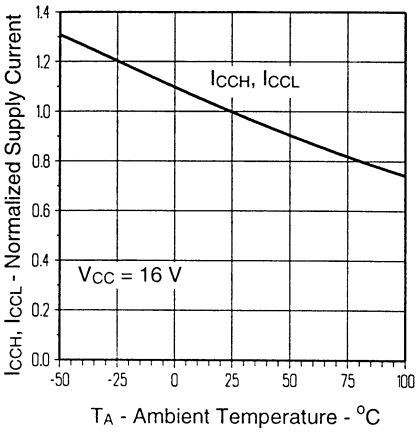


Normalized Spectral Response

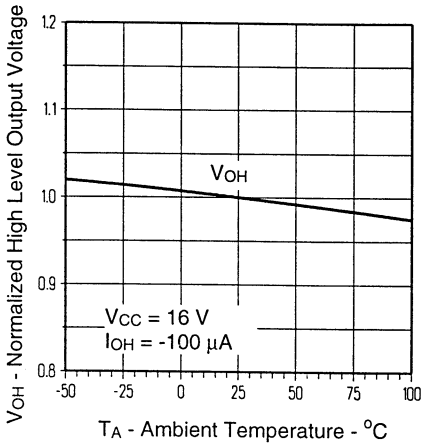


Typical Performance Curves

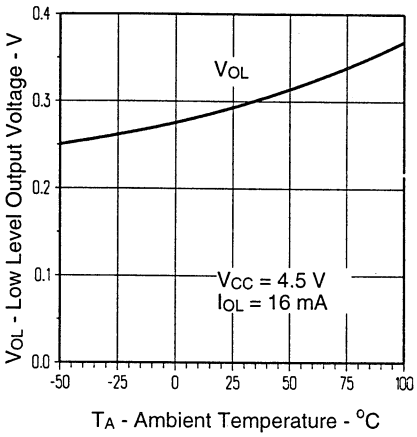
Normalized Supply Current vs. Ambient Temperature



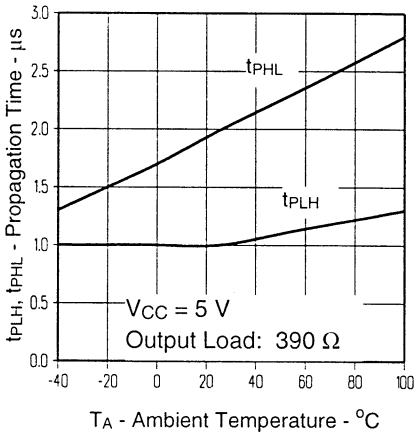
Normalized High Level Output Voltage vs. Ambient Temperature



Low Level Output Voltage vs. Ambient Temperature



Propagation Time vs. Ambient Temperature



Propagation Time vs. Irradiance

