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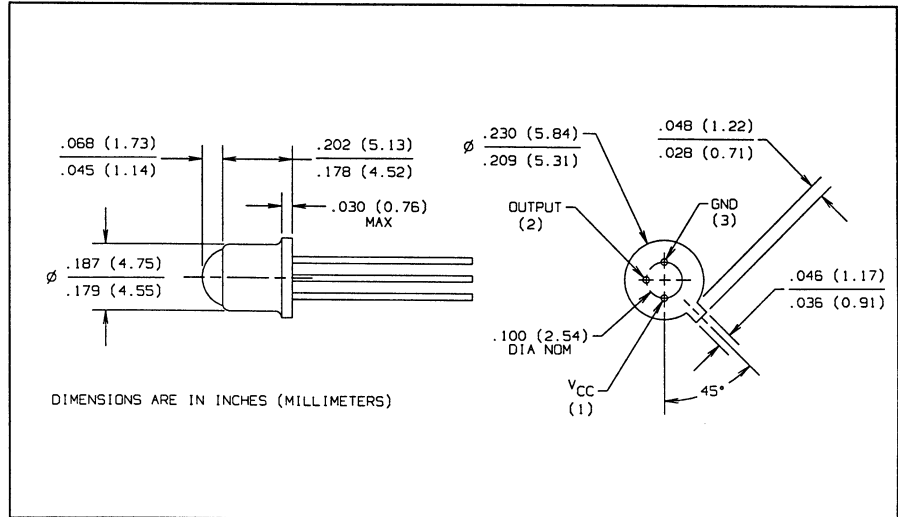
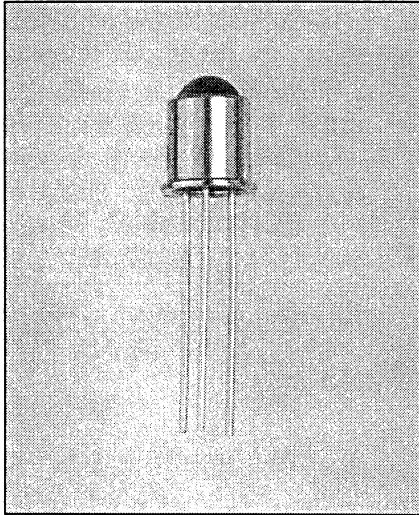
[TT Electronics/Optek Technology](#)  
[OPL820](#)

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Product Bulletin OPL820  
 January 1996

# Photologic<sup>®</sup> 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 ( $T_A = 25^\circ\text{C}$ unless otherwise noted.)

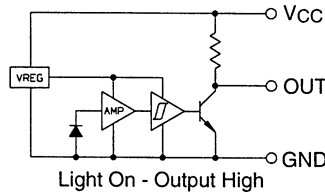
Supply Voltage	18 V
Storage Temperature Range	$-55^\circ\text{C}$ to $+125^\circ\text{C}$
Operating Temperature Range	$-40^\circ\text{C}$ to $+100^\circ\text{C}$
Lead Soldering Temperature	$240^\circ\text{C}$
Power Dissipation	200 $\text{mW}^{(2)}$
Duration of Output Short to $V_{CC}$	1 sec.
Output Voltage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

### Notes:

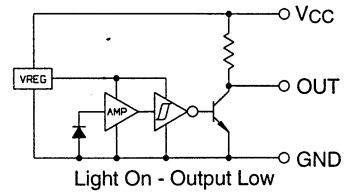
- (1) RMA flux is recommended. Soldering time may be extended to 10 seconds when flow soldering. Max. 20 grams of force may be applied to leads while at soldering temperatures.
- (2) Derate linearly  $5.7 \text{ mW}/^\circ\text{C}$  above  $90^\circ\text{C}$ .
- (3) Light measurements are made with an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

## Schematic

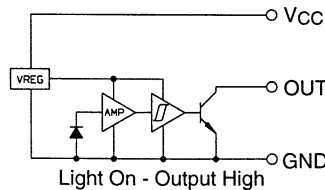
OPL820 Buffer/10K $\Omega$  PU



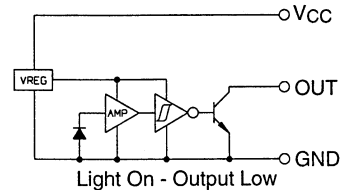
OPL821 Inverter/10K $\Omega$  PU



OPL820-OC Buffer/OC



OPL821-OC Inverter/OC



# Types OPL820, OPL821 Series

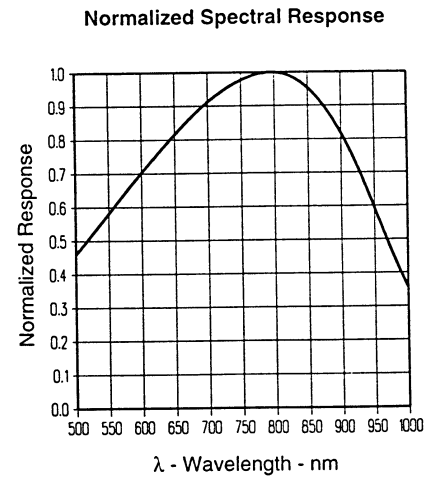
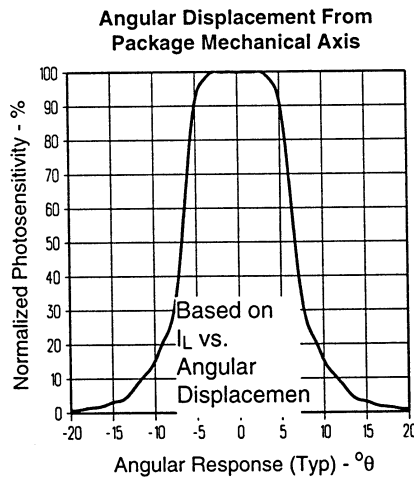
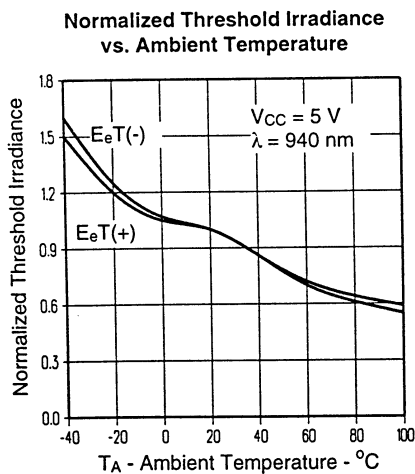
Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

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	$\text{mW}/\text{cm}^2$	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 Voltage OPL820 OPL821	$V_{CC}-1.5$		$V_{CC}$	V	$I_{OH} = -100\ \mu\text{A}$ , Note 4
$V_{OL}$	Low State Output Voltage			0.4	V	$I_{OL} = 16\ \text{mA}$ , Note 5
$I_{OH}$	High State Output Current OPL820-OC OPL821-OC			100	$\mu\text{A}$	$V_{OH} = 30\ \text{V}$ , Note 4
$t_r, t_f$	Output Rise Time, Output Fall Time		60		ns	$R_L = 390\ \Omega$
$t_{PLH}$	Propogation Delay Low to High State		1.0		$\mu\text{s}$	$R_L = 390\ \Omega$ , $E_e = 0.1\ \text{mW}/\text{cm}^2$
$t_{PHL}$	Propogation Delay High to Low State		2.1		$\mu\text{s}$	$R_L = 390\ \Omega$ , $E_e = 0.1\ \text{mW}/\text{cm}^2$
Data Rate	Data Rate Using NRZ Format		100		kHz	$R_L = 390\ \Omega$ , $E_e = 0.1\ \text{mW}/\text{cm}^2$

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SENSORS

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

## Typical Performance Curves



# Types OPL820, OPL821 Series



## Typical Performance Curves

