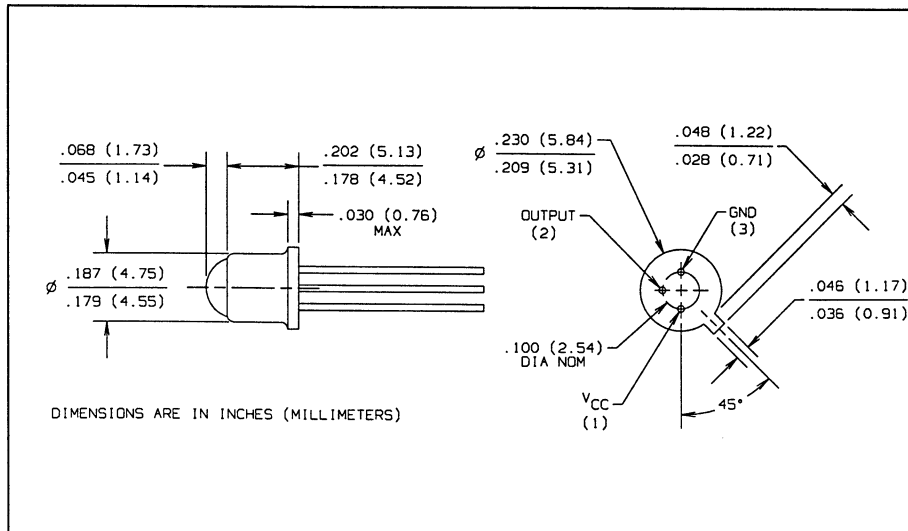
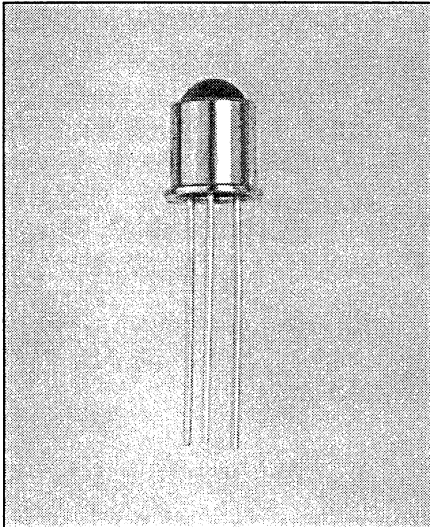


Photologic[®] Hermetic Sensor Types OPL820, OPL821 Series



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.)

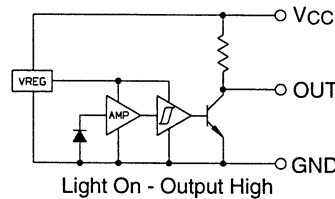
Supply Voltage	18 V
Storage Temperature Range	-55° C to +125° C
Operating Temperature Range	-40° C to +100° C
Lead Soldering Temperature	240° C
Power Dissipation	200 mW ⁽²⁾
Duration of Output Short to V _{CC}	1 sec
Output Voltage (High State)	30 V
Output Current Sink (Low State)	16 mA

Notes:

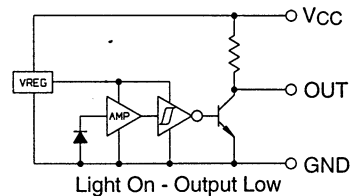
- (1) RMA flux is recommended. Soldering time may be extended to 10 seconds when flow soldering. Max. 20 grams of force may be applied to leads while at soldering temperatures.
- (2) Derate linearly 5.7 mW/° C above 90° C.
- (3) Light measurements are made with an LED source having a wavelength of 935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

Schematic

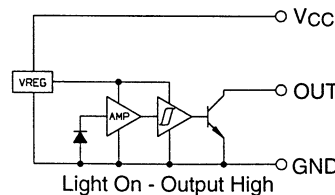
OPL820 Buffer/10KΩ PU



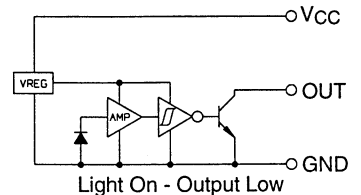
OPL821 Inverter/10KΩ PU



OPL820-OC Buffer/OC



OPL821-OC Inverter/OC



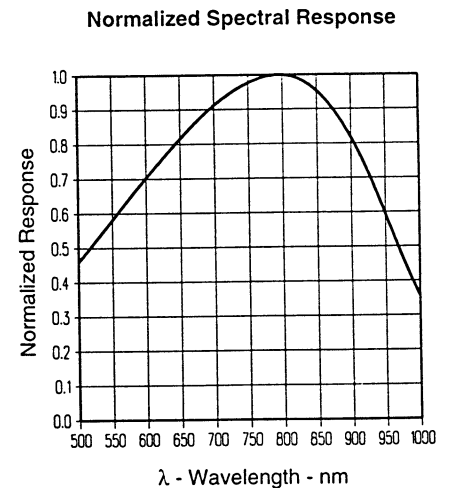
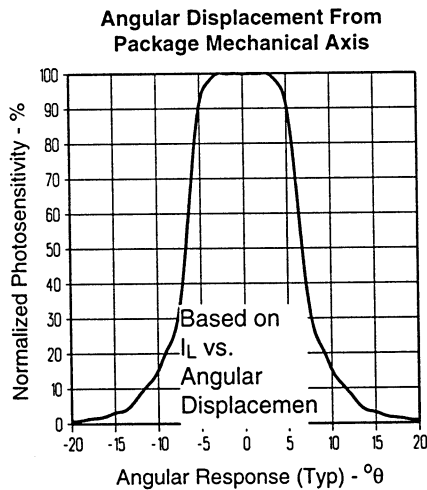
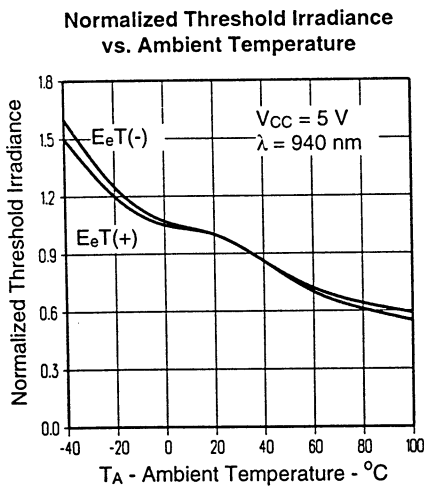
Types OPL820, OPL821 Series

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	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 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	μA	$V_{OH} = 30\ \text{V}$, Note 4
t_r, t_f	Output Rise Time, Output Fall Time		60		ns	$R_L = 390\ \Omega$
t_{PLH}	Propagation Delay Low to High State		1.0		μs	$R_L = 390\ \Omega$, $E_e = 0.1\ \text{mW}/\text{cm}^2$
t_{PHL}	Propagation Delay High to Low State		2.1		μs	$R_L = 390\ \Omega$, $E_e = 0.1\ \text{mW}/\text{cm}^2$
Data Rate	Data Rate Using NRZ Format		100		kHz	$R_L = 390\ \Omega$, $E_e = 0.1\ \text{mW}/\text{cm}^2$

- (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

