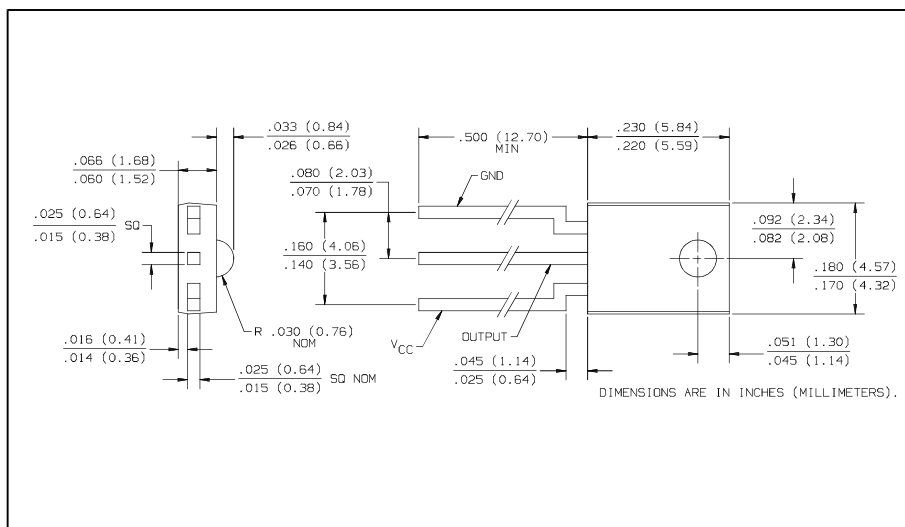
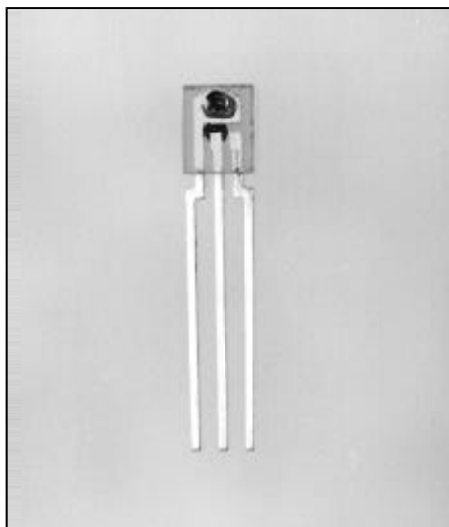


Photologic[®] Sensors

Types OPL530, OPL530-OC, OPL531, OPL531-OC



Features

- Four output options
- High noise immunity
- Direct TTL/LSTTL CMOS interface
- Low cost plastic side-looking package
- Mechanically and spectrally matched to the OP140 and OP240 series LED's
- Data rates to 250 kBaud
- Low power consumption

Description

The OPL530, OPL530-OC, OPL531, OPL531-OC contain a monolithic integrated circuit which incorporates a photodiode, amplifier, voltage regulator, Schmitt trigger and an NPN output transistor on a single silicon chip. The OPL530 and OPL531 includes a 10 K Ω pull-up resistor (R_L) from output to V_{CC} . The OPL530-OC and OPL531-OC have an open-collector output. These devices exhibit very stable performance over supply voltages ranging from 4.5 V to 16 V and a wide range of irradiance levels. The Photologic[®] chip is encapsulated in a molded plastic package which has an integral lens for enhanced optical coupling and minimal optical spacing.

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

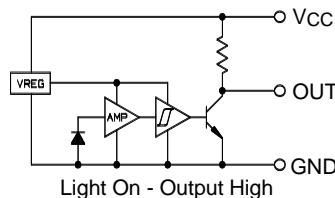
Supply Voltage, V_{CC}	18 V
Storage Temperature Range	-40°C to $+100^\circ\text{C}$
Operating Temperature Range	-40°C to $+85^\circ\text{C}$
Lead Soldering Temperature Range [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron]	240°C
Power Dissipation	90 mW
Voltage at Output Lead ⁽⁴⁾	35 V
Sinking Current	50 mA

Notes:

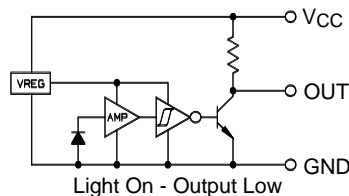
- (1) Derate linearly 2.67 mW/ $^\circ\text{C}$ above 70°C .
- (2) RMA flux is recommended. Duration can be extended to 10 sec. maximum when flow soldering. Max 20 grams force may be applied to the leads when soldering.
- (3) Irradiance measurements are made with $\lambda_i = 935\text{ nm}$.
- (4) OC versions only. For I_{CC} on pull-up versions add $V_{CC}/10\text{ k}\Omega$.

Schematics

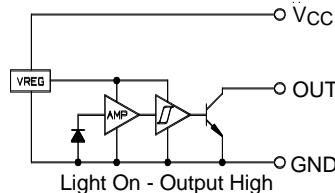
OPL530 Buffer/Pull-up Resistor



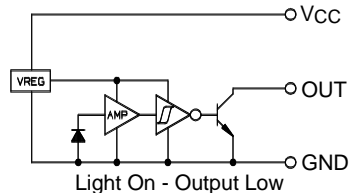
OPL531 Inverter/Pull-up Resistor



OPL530-OC Buffer/OC



OPL531-OC Inverter/OC



Types OPL530, OPL530-OC, OPL531, OPL531-OC

Electrical Characteristics (-40° C to +85° C unless otherwise noted) $V_{CC} = 4.5 \text{ V}$ to 16 V

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
V _{CC}	Operating Supply Voltage	4.5		16.0	V	
	Peak-to-Peak V _{CC} Ripple Necessary to Cause False Triggering of Output			2	V	f = DC to 50 MHz
I _{CC}	Supply Current ⁽⁴⁾		2.7	5.0	mA	E _e = 0 or 1 mW/cm ²
E _{eT} (+)	Positive-Going Threshold Irradiance ⁽³⁾					
	OPL530, OPL530-OC, OPL531, OPL531-OC	0.12		0.38	mW/cm ²	T _A = 25° C
	OPL530A, OPL530-OCA, OPL531A, OPL531-OCA	0.12		0.28	mW/cm ²	T _A = 25° C
	OPL530B, OPL530-OCB,OPL531B, OPL531-OCB	0.23		0.38	mW/cm ²	T _A = 25° C
E _{eT} (+)/E _{eT} (-)	Hysteresis Ratio	1.20		1.80		
ΔE _{eT} (+)(ΔT)	Temperature Coefficient	>0° C	-0.6		%/° C	
		<0° C	-1.6		%/° C	
OPL530, OPL530-OC (Buffers)						
I _{OH}	High Level Output Current ⁽⁴⁾		0.1	10	μA	V _{OH} = 30 V, E _e = 1 mW/cm ²
V _{OL}	Low Level Output Voltage		0.2	0.40	V	I _{OL} = 16 mA, E _e = 0
OPL531, OPL531-OC (Inverters)						
I _{OH}	High Level Output Current ⁽⁴⁾		0.1	10	μA	V _{OH} = 30 V, E _e = 0
V _{OL}	Low Level Output Voltage		0.2	0.40	V	I _{OL} = 16 mA, E _e = 1 mW/cm ²
OPL530, OPL531						
t _r	Output Rise Time		1.5		μs	E _e = 0 or 1 mW/cm ² , C _L = 50 pF
t _f	Output Fall Time		20		ns	
OPL530-OC, OPL531-OC						
t _r	Output Rise Time		50		ns	E _e = 0 or 1 mW/cm ² , R _L = 300 Ω to 5 V, C _L = 50 pF
t _f	Output Fall Time		20		ns	
OPL530, OPL530-OC, OPL531, OPL531-OC						
tpE _{eT} (+)	Propagation Delay		1.0		μs	E _e = 0 or 1 mW/cm ² , R _L = 300 Ω to 5 V, C _L = 50 pF
tpE _{eT} (-)	Propagation Delay		3.0		μs	