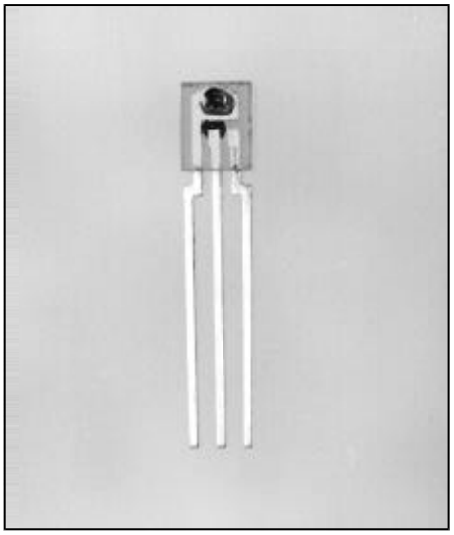
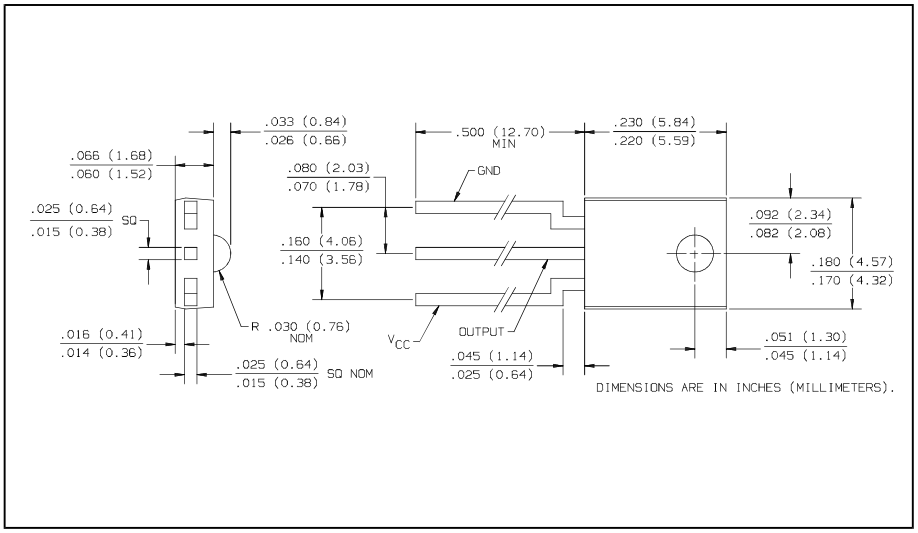
Photologic® Sensors
Types OPL530, OPL530-OC, OPL531, OPL531-OC





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 KΩ 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.

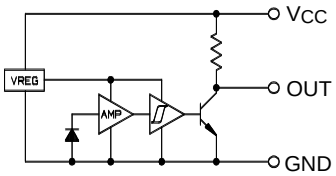
Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Supply Voltage, V_{CC}	18 V
Storage Temperature Range	-40° C to +100° C
Operating Temperature Range	-40° C to +85° 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/° 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 λi = 935 nm.
(4) OC versions only. For I_{CC} on pull-up versions add V_{CC}/10 kΩ.

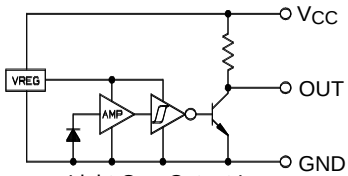
Schematics

OPL530 Buffer/Pull-up Resistor



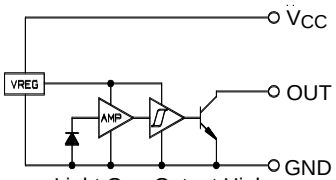
Light On - Output High

OPL531 Inverter/Pull-up Resistor



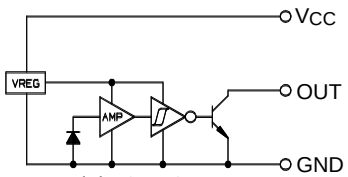
Light On - Output Low

OPL530-OC Buffer/OC



Light On - Output High

OPL531-OC Inverter/OC



Light On - Output Low

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

Electrical Characteristics (-40° C to +85° C unless otherwise noted) V_{CC} = 4.5 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 OPL530A, OPL530-OCA, OPL531A, OPL531-OCA OPL530B, OPL530-OCB,OPL531B, OPL531-OCB	 0.12 0.12 0.23		 0.38 0.28 0.38	 mW/cm^2 mW/cm^2 mW/cm^2	 T_A = 25° C T_A = 25° C T_A = 25° C
$E_{eT}(+)/E_{eT}(-)$	Hysteresis Ratio	1.20		1.80		
$\Delta E_{eT}(+)(\Delta T)$	Temperature Coefficient >0° C <0° C		-0.6 -1.6		%/° C %/° 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	

PHOTOLOGIC® SENSORS