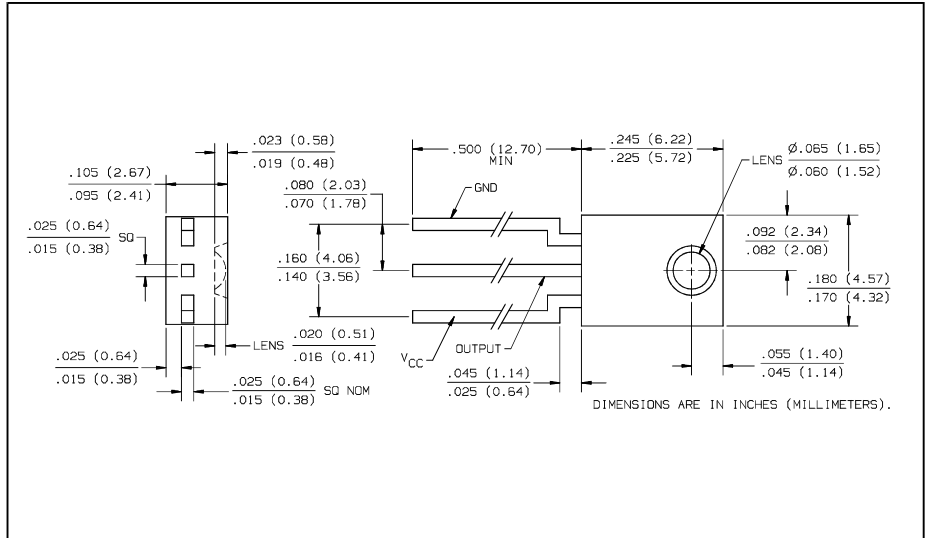


# Photologic<sup>®</sup> Sensors

## Types OPL535, OPL535-OC, OPL536, OPL536-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 OP145 and OP245 series LED's
- Data rates to 250 kBaud
- Low power consumption

### Description

The OPL535, OPL535-OC, OPL536, OPL536-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 OPL535 and OPL536 include a 10 K $\Omega$  pull-up resistor ( $R_L$ ) from output to  $V_{CC}$ . The OPL535-OC and OPL536-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<sup>®</sup> chip is encapsulated in a molded plastic package which has a recessed integral lens for enhanced optical coupling combined with mechanical protection.

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

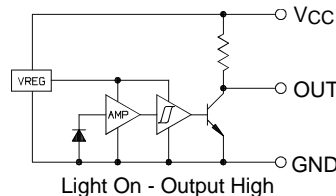
Supply Voltage, $V_{CC}$ .....	18 V
Storage Temperature Range .....	$-40^\circ\text{C}$ to $+100^\circ\text{C}$
Operating Temperature Range .....	$-40^\circ\text{C}$ to $+85^\circ\text{C}$
Lead Soldering Temperature Range [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron] .....	$240^\circ\text{C}$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

### Notes:

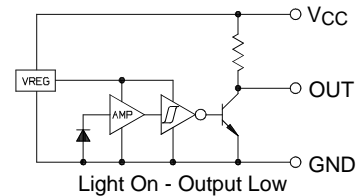
- (1) Derate linearly 2.67 mW/ $^\circ\text{C}$  above  $70^\circ\text{C}$ .
- (2) RMA flux is recommended. Duration can be extended to 10 sec. maximum when flow soldering. Max 20 grams force may be applied to the leads when soldering.
- (3) Irradiance measurements are made with  $\lambda_i = 935\text{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

### Schematics

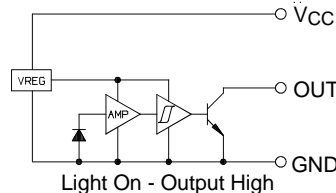
OPL535 Buffer/Pull-up Resistor



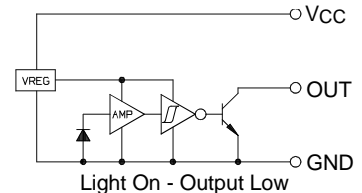
OPL536 Inverter/Pull-up Resistor



OPL535-OC Buffer/OC



OPL536-OC Inverter/OC



# Types OPL535, OPL535-OC, OPL536, OPL536-OC

Electrical Characteristics (-40° C to +85° C unless otherwise noted) V<sub>CC</sub> = 4.5 V to 16 V

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
V <sub>CC</sub>	Operating Supply Voltage	4.5		16.0	V	
	Peak-to-Peak V <sub>CC</sub> Ripple Necessary to Cause False Triggering of Output			2	V	f = DC to 50 MHz
I <sub>CC</sub>	Supply Current <sup>(4)</sup>		2.7	5.0	mA	E <sub>e</sub> = 0 or 1 mW/cm <sup>2</sup>
E <sub>eT</sub> (+)	Positive-Going Threshold Irradiance <sup>(3)</sup>					
	OPL535, OPL535-OC, OPL536, OPL536-OC	0.12		0.38	mW/cm <sup>2</sup>	T <sub>A</sub> = 25° C
	OPL535A, OPL535-OCA, OPL536A, OPL536-OCA OPL535B, OPL535-OCB, OPL536B, OPL536-OCB	0.12 0.23		0.28 0.38	mW/cm <sup>2</sup> mW/cm <sup>2</sup>	T <sub>A</sub> = 25° C T <sub>A</sub> = 25° C
E <sub>eT</sub> (+)/E <sub>eT</sub> (-)	Hysteresis Ratio	1.20		1.80		
ΔE <sub>eT</sub> (+)(ΔT)	Temperature Coefficient	>0° C		-0.6	%/° C	
		<0° C		-1.6	%/° C	
<b>OPL535, OPL535-OC (Buffers)</b>						
I <sub>OH</sub>	High Level Output Current <sup>(4)</sup>		0.1	10	μA	V <sub>OH</sub> = 30 V, E <sub>e</sub> = 1 mW/cm <sup>2</sup>
V <sub>OL</sub>	Low Level Output Voltage		0.2	0.40	V	I <sub>OL</sub> = 16 mA, E <sub>e</sub> = 0
<b>OPL536, OPL536-OC (Inverters)</b>						
I <sub>OH</sub>	High Level Output Current <sup>(4)</sup>		0.1	10	μA	V <sub>OH</sub> = 30 V, E <sub>e</sub> = 0
V <sub>OL</sub>	Low Level Output Voltage		0.2	0.40	V	I <sub>OL</sub> = 16 mA, E <sub>e</sub> = 1 mW/cm <sup>2</sup>
<b>OPL535, OPL536</b>						
t <sub>r</sub>	Output Rise Time		1.5		μs	E <sub>e</sub> = 0 or 1 mW/cm <sup>2</sup> , C <sub>L</sub> = 50 pF
t <sub>f</sub>	Output Fall Time		20		ns	
<b>OPL535-OC, OPL536-OC</b>						
t <sub>r</sub>	Output Rise Time		50		ns	E <sub>e</sub> = 0 or 1 mW/cm <sup>2</sup> , R <sub>L</sub> = 300 Ω to 5 V, C <sub>L</sub> = 50 pF
t <sub>f</sub>	Output Fall Time		20		ns	
<b>OPL535, OPL535-OC, OPL536, OPL536-OC</b>						
tpE <sub>eT</sub> (+)	Propagation Delay		1.0		μs	E <sub>e</sub> = 0 or 1 mW/cm <sup>2</sup> ,
tpE <sub>eT</sub> (-)	Propagation Delay		3.0		μs	R <sub>L</sub> = 300 Ω to 5 V, C <sub>L</sub> = 50 pF

PHOTOLOGIC®  
SENSORS

Optek reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Optek Technology, Inc. 1215 W. Crosby Road Carrollton, Texas 75006 (972)323-2200 Fax (972)323-2396