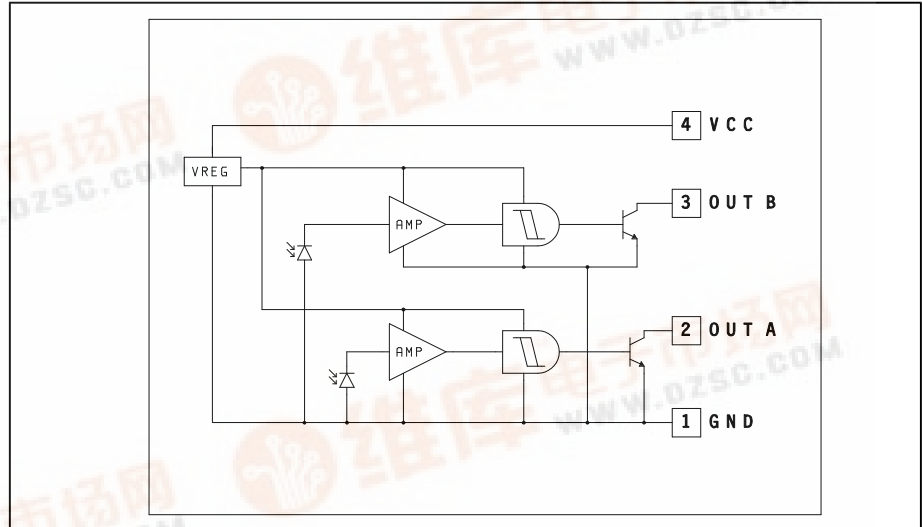


Product Bulletin OPL583
August 1996

Dual Channel Photologic[®] Encoder Detector Type OPL583



Features

- Two matched detectors with photolithographic control of relative position
- Dual Photologic[®] circuitry in single package provides reduced component count
- Open collector inverter output for flexibility of circuit interface
- Low cost plastic housing

Description

The OPL583 contains a monolithic integrated circuit which incorporates two independent photodiodes, linear amplifiers, Schmitt trigger circuits, and output transistors served by a common voltage regulator. The outputs are TTL/LSTTL compatible and can drive 8 TTL loads over a voltage range from 4.5 to 16 V. Applications include linear and rotary encoders with resolutions determined by external apertures. The fixed relative position of the two photodiodes and the matched characteristics of the two channels allow considerable design flexibility.

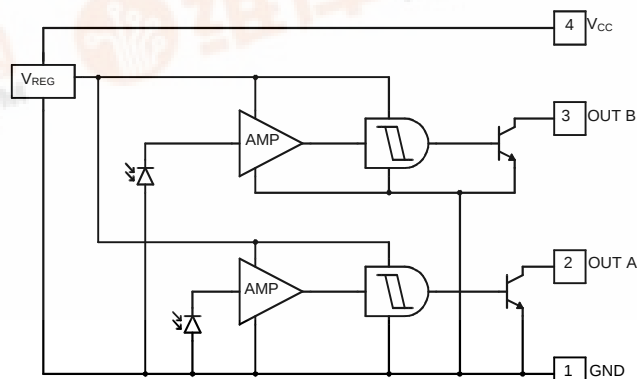
Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Supply Voltage	18 V ⁽⁵⁾
Storage Temperature	-40°C to $+100^\circ\text{C}$
Operate Temperature	-40°C to $+85^\circ\text{C}$
Lead Solder Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron]	260°C ⁽²⁾
Power Dissipation	200 mW ⁽¹⁾
Duration of Output Short to V_{CC}	1.00 sec.
Voltage At Output	18 V
Low Level Output Current (sinking)	40 mA

Notes:

- (1) Derate linearly 2.67 mW/ $^\circ\text{C}$ above 25°C .
- (2) RMA flux is recommended. Duration can be extended to 10 sec. max when flow soldering. Max 20 grams force may be applied to leads when flow soldering.
- (3) A 0.01 μF capacitor should be used across the V_{CC} and GND leads to stabilize the power supply line.
- (4) Irradiance measurements are made with $\lambda = 940\text{ nm}$.
- (5) Derate linearly 0.37 V/ $^\circ\text{C}$ above 58°C .

Schematic



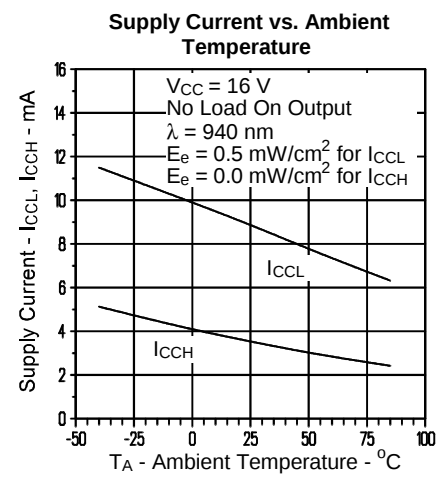
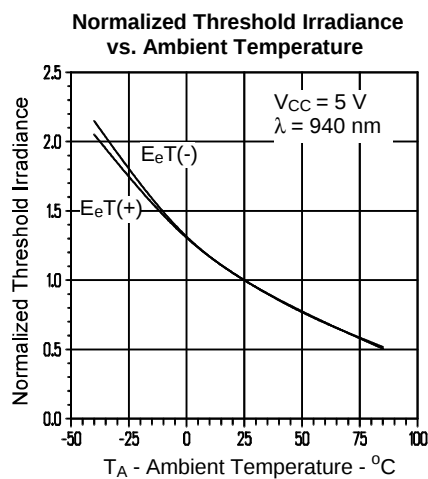
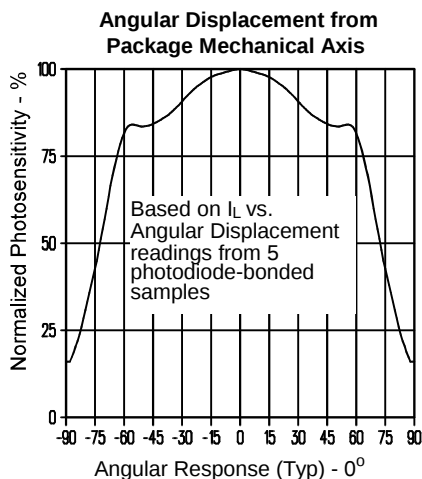
Type OPL583

Electrical Characteristics ($T_A = 25^\circ\text{C}$, $V_{CC} = 4.5\text{ V} - 16\text{ V}$ unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
V_{CC}	Operating Supply Voltage ⁽³⁾	4.5		16	V	
$E_{eT(+)}$	Positive Going Threshold Irradiance ⁽⁴⁾	0.05	0.10	0.25	mW/cm^2	
$E_{eT(+)} / E_{eT(-)}$	Hysteresis Ratio	1.1	1.5	2.0		
MATCH	Channel Match $E_{eT(+,A)} / E_{eT(+,B)}$	0.67	1.00	1.50		
I_{CCL}	Supply Current Both Outputs Low (Both Photodiodes Irradiated)		8.5	12.0	mA	$E_e = 0.5\text{ mW}/\text{cm}^2$, No Load on Output
I_{CCH}	Supply Current Both Outputs High (Both Photodiodes Shaded)		3.5	6.0	mA	$E_e = 0\text{ mW}/\text{cm}^2$, No Load on Output
I_{CCM}	Supply Current Mixed Output States (One High, One Low)		6		mA	$E_e = 0\text{ mW}/\text{cm}^2$ and $0.5\text{ mW}/\text{cm}^2$
I_{OH}	High Level Output Current		1.0	30.0	μA	$E_e = 0\text{ mW}/\text{cm}^2$, $V_{OH} = 16\text{ V}$
V_{OL}	Low Level Output Voltage		0.21	0.40	V	$E_e = 0.5\text{ mW}/\text{cm}^2$, $I_{OL} = 12.8\text{ mA}$
T_{PHL} T_{PLH}	Propagation Delay Output High to Low Output Low to High		2 10		μs μs	$V_{CC} = 5\text{ V}$, $R_L = 360\ \Omega$ $E_e = 0$ or $0.5\text{ mW}/\text{cm}^2$, $f = 10\text{ kHz}$, D.C. = 50%
t_r t_f	Output Rise Time Output Fall Time		20 15		ns ns	

PHOTOLOGIC[®]
SENSORS

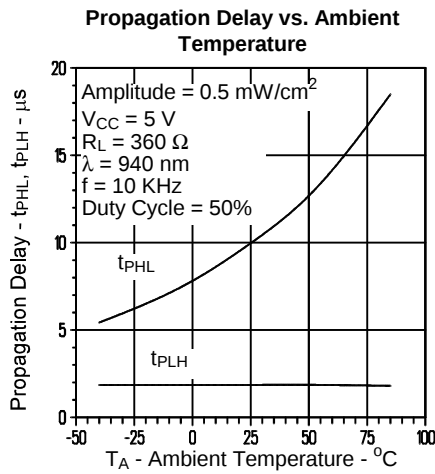
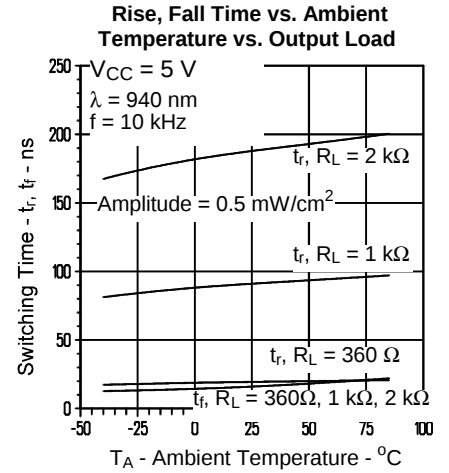
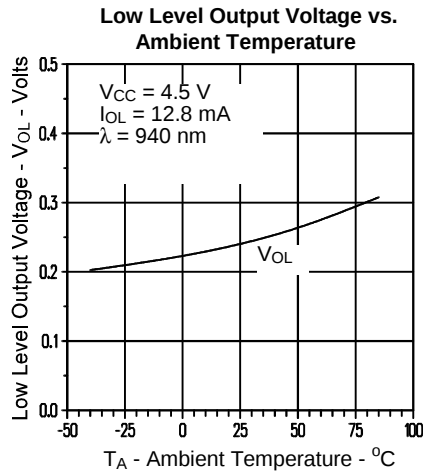
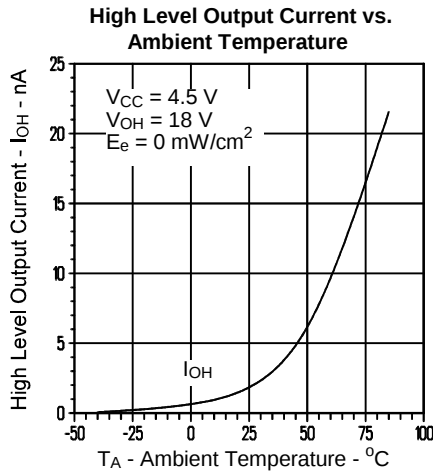
Typical Performance Curves



Type OPL583



Typical Performance Curves



Typical Application

