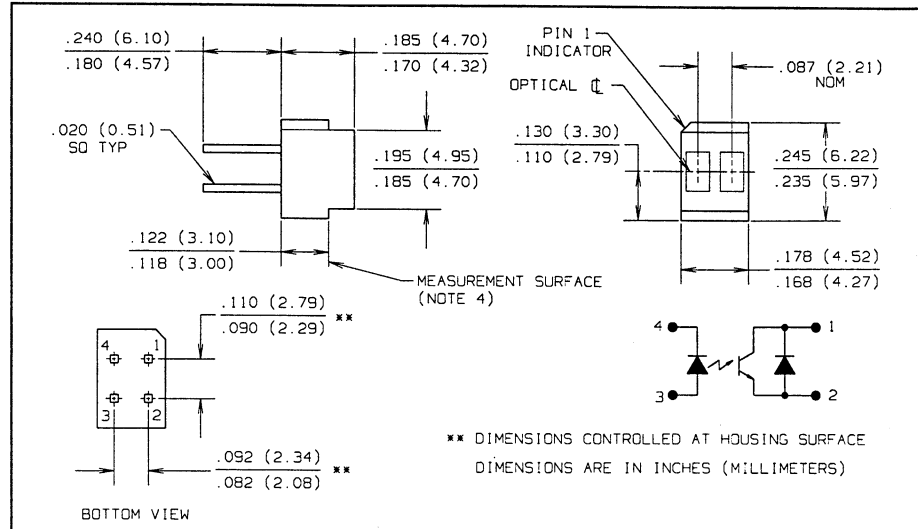
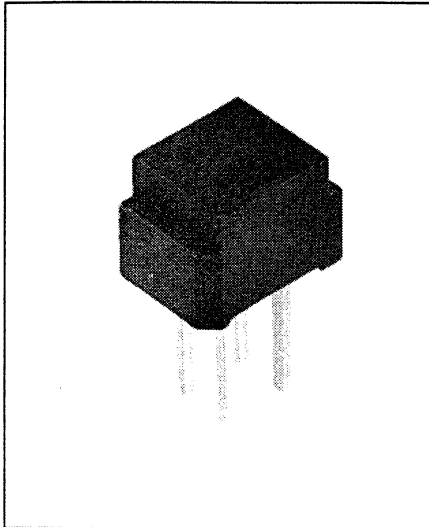


# Reflective Object Sensors

## Types OPB608A, OPB608B, OPB608C



### Features

- Phototransistor output
- Unfocused for sensing diffuse surface
- Low cost plastic housing
- Enhanced signal to noise ratio
- Reduced ambient light sensitivity

### Description

The OPB608 consists of an infrared emitting diode and an NPN silicon phototransistor mounted "side-by-side" on parallel axes in a black opaque plastic housing. Both the emitting diode and phototransistor are encapsulated in a filtering epoxy to further reduce ambient light noise. The phototransistor responds to radiation from the emitter only when a reflective object passes within its field of view.

The phototransistor has enhanced low current roll off to improve the contrast ratio and immunity to background irradiance.

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

Storage and Operating Temperature .....  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$   
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron] .....  $240^\circ\text{C}^{(1)}$

#### Input Diode

Forward DC Current ..... 50 mA  
Peak Forward Current (1  $\mu\text{s}$  pulse width, 300 pps) ..... 3.0 A  
Reverse DC Voltage ..... 2.0 V  
Power Dissipation .....  $75\text{ mW}^{(2)}$

#### Output Phototransistor

Collector-Emitter Voltage ..... 30 V  
Emitter Reverse Current ..... 10 mA  
Collector DC Current ..... 25 mA  
Power Dissipation .....  $100\text{ mW}^{(3)}$

#### Notes:

- (1) RMA flux is recommended. Max 20 grams force may be applied to the leads when soldering. Duration can be extended to 10 sec. max when flow soldering.
- (2) Derate linearly  $1.25\text{ mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (3) Derate linearly  $1.67\text{ mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (4) d is the distance from the assembly measurement surface to the reflective surface.
- (5) Measured using Eastman Kodak neutral white test card with 90% diffuse reflectance as a reflecting surface.
- (6) Off state collector current  $I_{C(OFF)}$  is measured with no reflective surface in the optical path.

# Types OPB608A, OPB608B, OPB608C

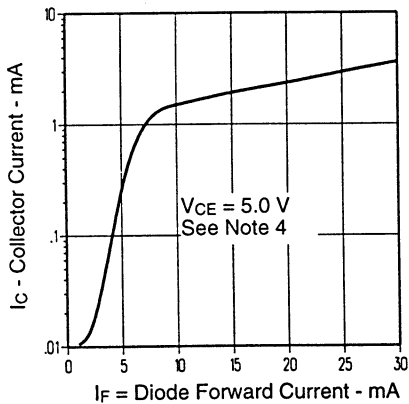
Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

REFLECTIVE OBJECT SENSORS

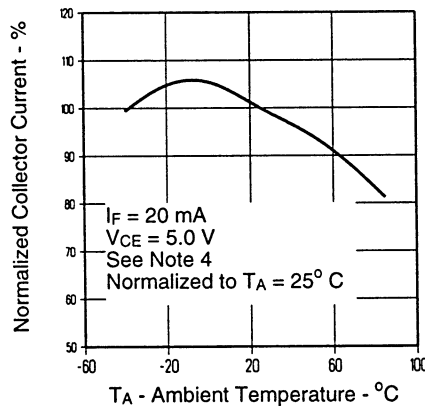
SYMBOL	PARAMETER	MIN	MAX	UNITS	TEST CONDITIONS
<b>Input Diode</b>					
$V_F$	Forward Voltage		1.70	V	$I_F = 20\text{ mA}$
$I_R$	Reverse Current		100	$\mu\text{A}$	$V_R = 2.0\text{ V}$
<b>Output Phototransistor</b>					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30		V	$I_C = 100\ \mu\text{A}$
$I_{ECO}$	Emitter Reverse Current		100	$\mu\text{A}$	$V_{EC} = 0.4\text{ V}$
$I_{CEO}$	Collector Dark Current		100	nA	$V_{CE} = 5.0\text{ V}, I_F = 0, E_e = \leq 0.10\ \mu\text{W}/\text{cm}^2$
<b>Combined</b>					
$I_{C(ON)}$	On-State Collector Current	OPB608A OPB608B OPB608C	2.0 1.0 0.5	4.0 mA mA mA	$V_{CE} = 5.0\text{ V}, I_F = 20\text{ mA}, d = 0.110\text{ in. (2.79 mm)}^{(4)(5)}$
$I_{C(OFF)}$	Off-State Collector Current			100	nA $V_{CE} = 5.0\text{ V}, I_F = 20\text{ mA}^{(6)}$

## Typical Performance Curves

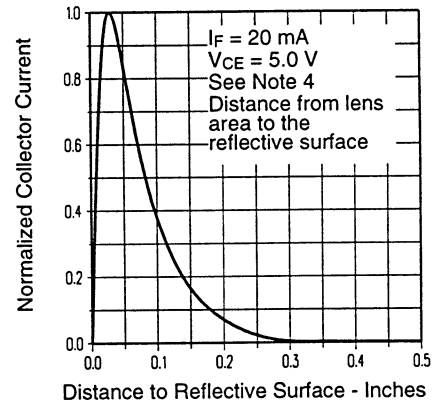
Collector Current vs Diode Forward Current



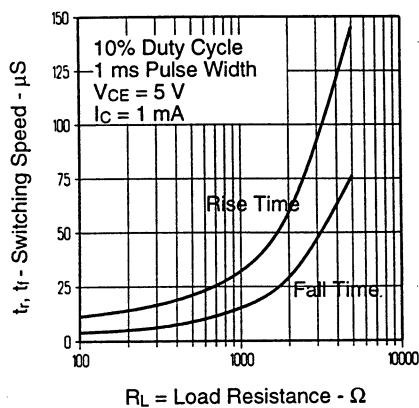
Normalized Collector Current vs Ambient Temperature



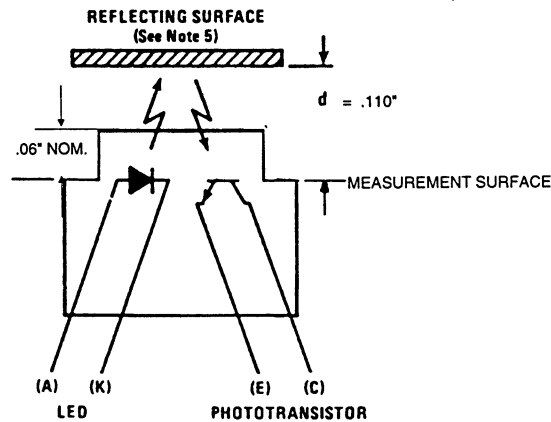
Normalized Collector Current vs Object Distance



Rise and Fall vs Load Resistance



## Test Condition



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

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