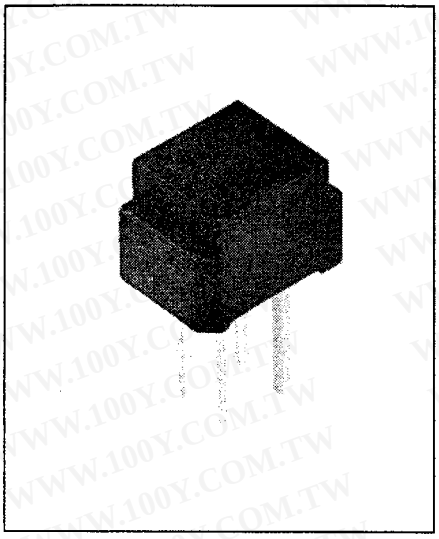
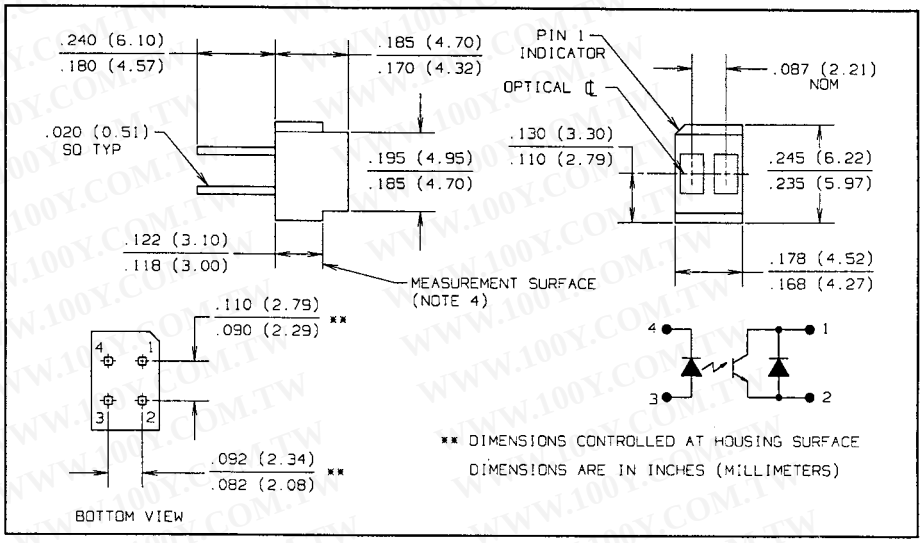
OPTEK

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° C unless otherwise noted)

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

Input Diode

Forward DC Current ..... 50 mA
Peak Forward Current (1 µs pulse width, 300 pps) ..... 3.0 A
Reverse DC Voltage ..... 2.0 V
Power Dissipation ..... 75 mW(2)

Output Phototransistor

Collector-Emitter Voltage ..... 30 V
EmitterReverse Current ..... 10 mA
Collector DC Current ..... 25 mA
Power Dissipation ..... 100 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 mW/° C above 25° C.
(3) Derate linearly 1.67 mW/° C above 25° 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.

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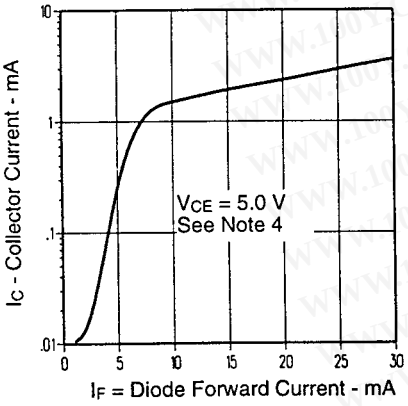
Electrical Characteristics (T_A = 25° C unless otherwise noted)

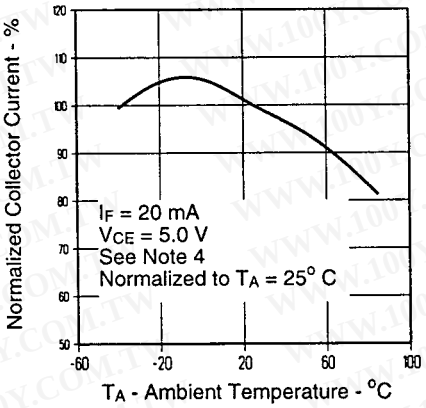
SYMBOL	PARAMETER		MIN	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage			1.70	V	I_F = 20 mA
I_R	Reverse Current			100	µA	V_R = 2.0 V
Output Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage		30		V	I_C = 100 µA
I_{ECO}	Emitter Reverse Current			100	µA	V_{EC} = 0.4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

Typical Performance Curves

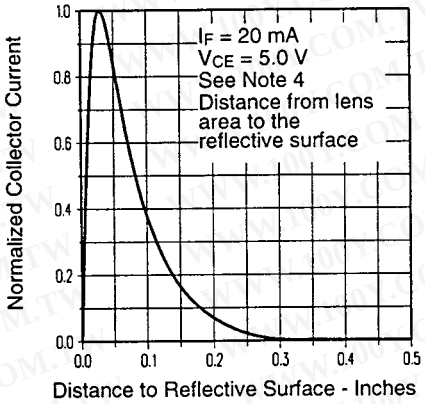
Collector Current vs Diode Forward Current



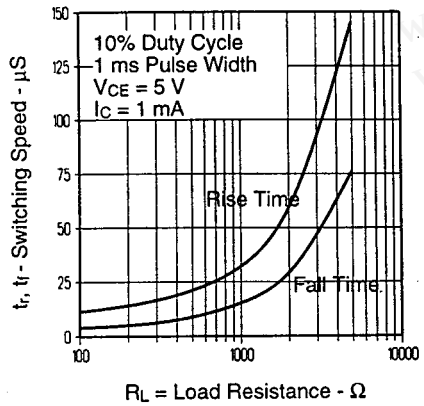
Normalized Collector Current vs Ambient Temperature



Normalized Collector Current vs Object Distance



Rise and Fall vs Load Resistance



Test Condition