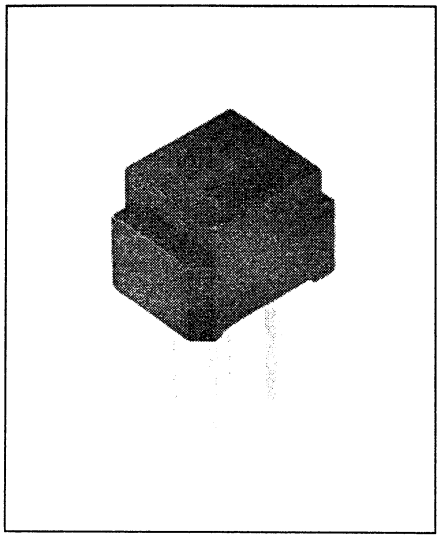
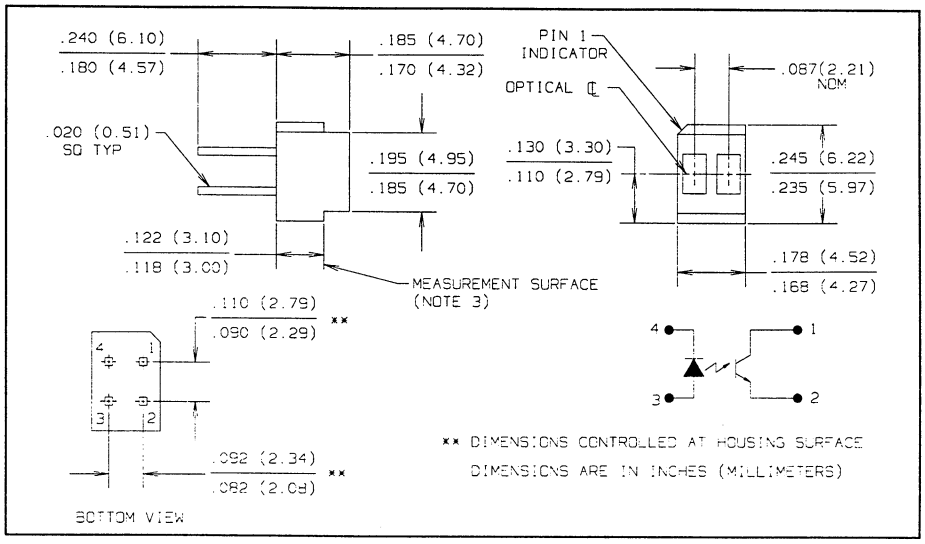
Reflective Object Sensors
Types OPB606A, OPB606B, OPB606C





Features

- Phototransistor output
- Unfocused for sensing diffuse surface
- Low cost plastic housing

Description

The OPB606 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 reduce ambient light noise. The phototransistor responds to radiation from the emitter only when a reflective object passes within its field of view.

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
Emitter-Collector Voltage	5.0 V
Collector DC Current	25 mA
Power Dissipation	75 mW(2)

Notes:
(1) RMA flux is recommended. Duration can be extended to 10 sec. max when flow soldering.
(2) Derate linearly 1.25 mW/° C above 25° C.
(3) d is the distance from the assembly measurement surface to the reflective surface.
(4) Measured using Eastman Kodak neutral white test card with 90% diffuse reflectance as a reflecting surface.
(5) Off state collector current $I_{C(OFF)}$ is measured with no reflective surface in the optical path.
(6) Lower curve is a calculated worst case and not the conventional - 2σ limit.
(7) All parameters tested using pulse techniques.

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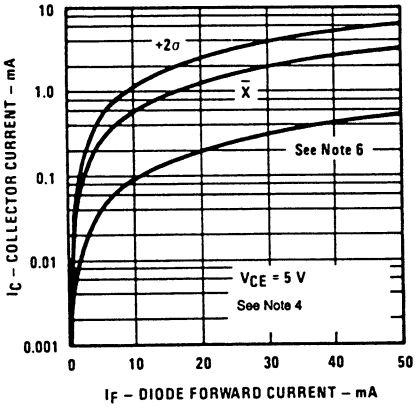
Electrical Characteristics (T_A = 25° C unless otherwise noted)

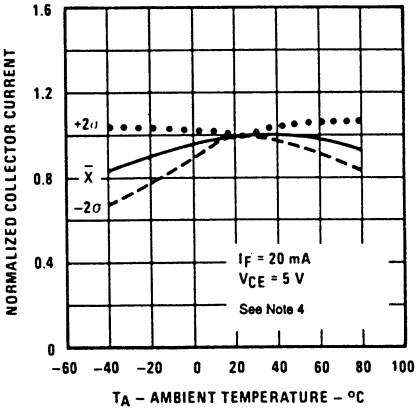
SYMBOL	PARAMETER		MIN	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage			1.70	V	I_F = 20 mA
I_R	Reverse Current			100	µA	V_R = 2.0 V
Output Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage		30		V	I_C = 100 µA,
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage		5.0		V	I_E = 100 µA,
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	OPB606A	500		µA	V_{CE} = 5.0 V, I_F = 20 mA, d = 0.110 in. (2.79 mm) (3)(4)
		OPB606B	350		µA	
		OPB606C	200		µA	
$I_{C(OFF)}$	Off-State Collector Current			200	nA	V_{CE} = 5.0 V, I_F = 20 mA, (5)
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage			0.40	V	IF = 20 mA, I_C = 100 µA, d = 0.110 in. (2.79 mm) (3)(4)

Typical Performance Curves

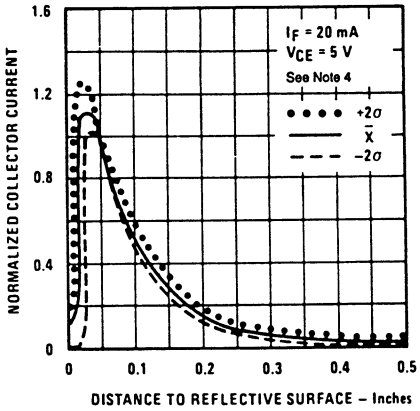
Collector Current vs. Diode Forward Current



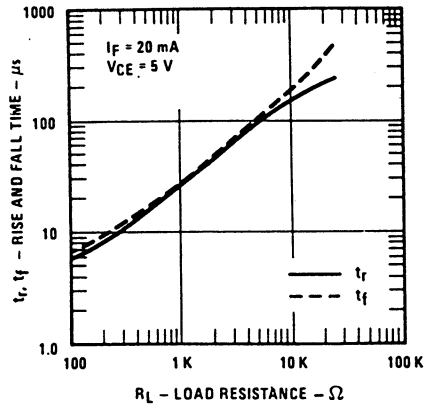
Normalized Collector Current vs. Ambient Temperature



Normalized Collector Current vs. Object Distance



Rise and Fall Time vs. Load Resistance



Test Condition