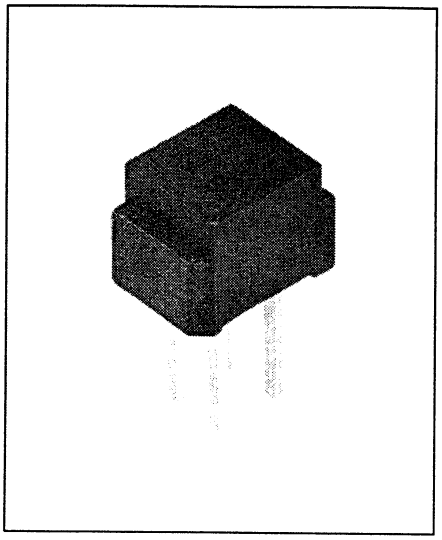
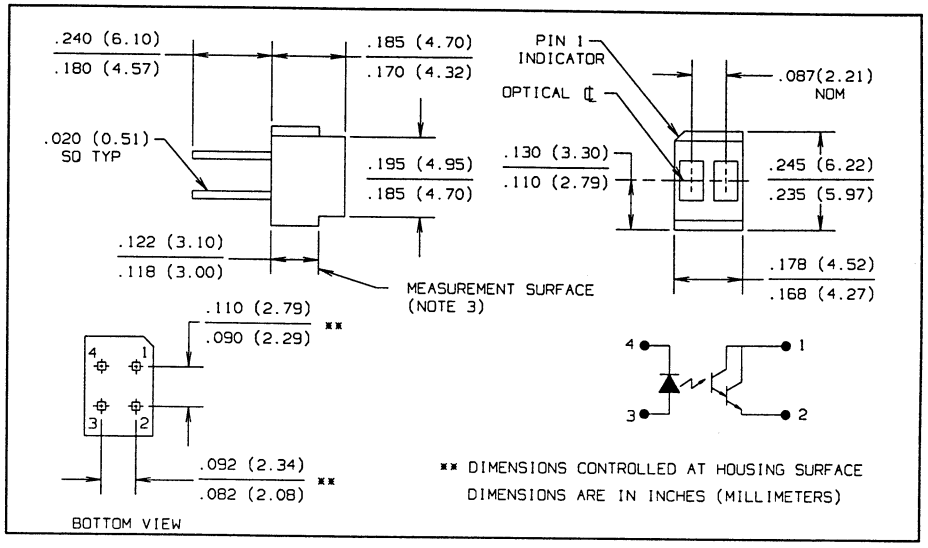
Reflective Object Sensors
Types OPB607A, OPB607B, OPB607C





Features

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

Description

The OPB607 consists of an infrared emitting diode and an NPN silicon photodarlington mounted "side-by-side" on parallel axes in a gray opaque plastic housing. Both the emitting diode and photodarlington are encapsulated in a filtering epoxy to reduce ambient light noise. The photodarlington 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 Photodarlington

Collector-Emitter Voltage	15 V
Emitter-Collector Voltage	5.0 V
Collector DC Current	125 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 measured using pulse techniques.

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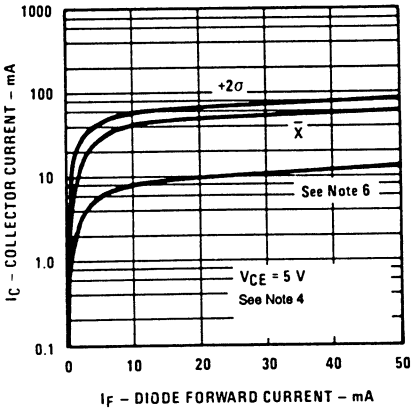
Electrical Characteristics (T_A = 25° C unless otherwise noted)

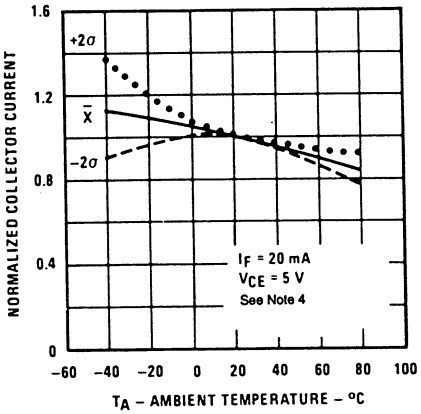
SYMBOL	PARAMETER		MIN	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage			1.70	V	I_F = 20 mA
I_R	Reverse Current			100	µA	V_R = 2.0 V
Output Photodarlington						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage		15		V	I_C = 100 µA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage		5.0		V	I_E = 100 µA
I_{CEO}	Collector Dark Current			250	nA	V_{CE} = 5.0 V
Combined						
$I_{C(ON)}$	On-State Collector Current	OPB607A OPB607B OPB607C	25 17 10		mA mA mA	V_{CE} = 5.0 V, I_F = 20 mA, d = 0.110 in. (2.79 mm)(3)(4)
$I_{C(OFF)}$	Off-State Collector Current			10	µA	V_{CE} = 5.0 V, I_F = 20 mA(5)
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage			1.10	V	I_F = 20 mA, I_C = 2 mA, d = 0.110 in. (2.79 mm)(3)(4)

Typical Performance Curves

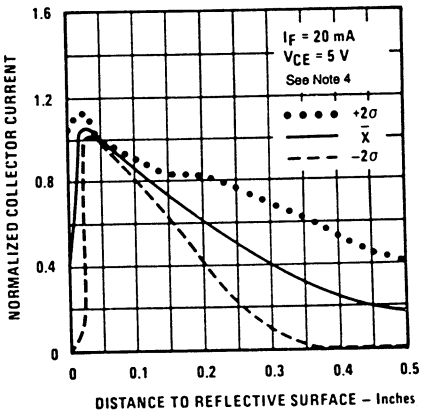
Collector Current vs. Diode Forward Current



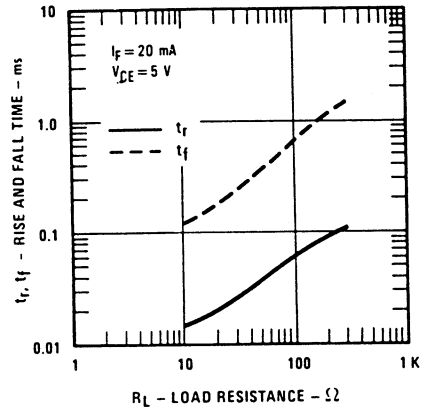
Normalized Collector Current vs. Ambient Temperature



Normalized Collector Current vs. Object Distance



Rise and Fall Time vs. Load Resistance



Test Condition