

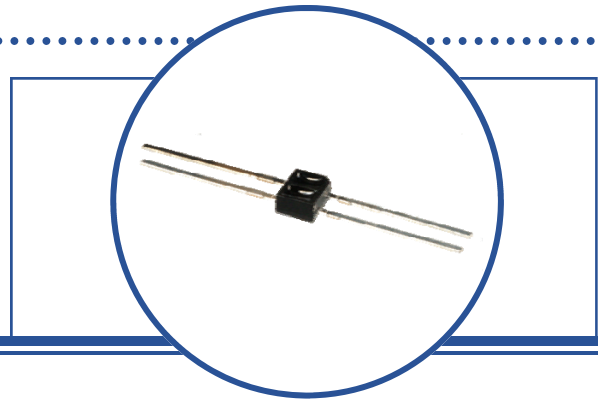
# Reflective Object Sensor

## OPB609 Series



### Features:

- OP609 emitter (940 nm IR-LED)
- Unfocused for sensing diffuse surface
- Low-cost plastic housing
- High-speed phototransistor output



### Description:

The **OPB609** consists of an 940 nm, Light Emitting Diode (LED) and an NPN silicon Phototransistor, which are mounted "side-by-side" on parallel axes in a black opaque plastic housing. This unfocused reflective object sensor is ideal for detection of diffuse materials such as paper, labels, or anything with a matte finish.

Custom electrical, wire and cabling and connectors are available. Contact your local representative or OPTEK for more information.

### Applications:

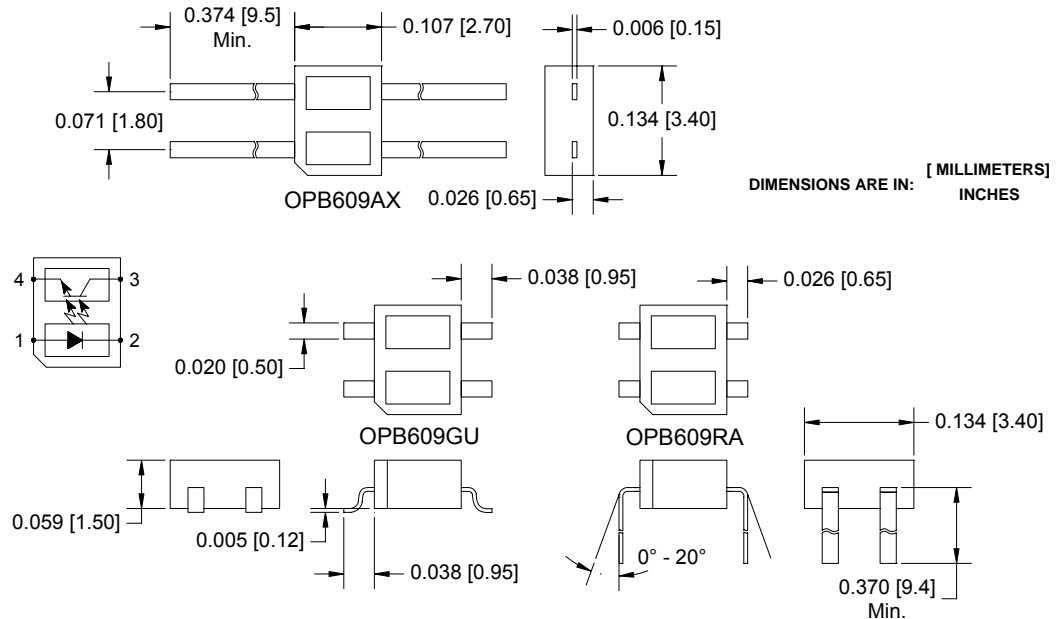
- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End-of-travel sensor
- Door sensor
- Edge detection
- Paper jam detection
- Mark detection

**CONTAINS POLYSULFONE**

To avoid stress cracking, we suggest using ND Industries' **Vibra-Tite** for thread-locking. **Vibra-Tite** evaporates fast without causing structural failure in OPTEK's molded plastics.

Ordering Information	
Part Number	Description
OPB609AX	Reflective Object Sensor with IR LED
OPB609GU	
OPB609RA	

Pin #	Function
1	Anode
2	Cathode
3	Collector
4	Emitter



**RoHS**

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

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

Storage and Operating Temperature Range	-25° C to +85° C
Lead Soldering Temperature [1/16 inch (1.6 mm) from the case for 5 seconds with soldering iron] <sup>(1)</sup>	260° C <sup>(1)</sup>

**Input LED**

Forward DC Current	50 mA
Peak Forward Current (1 $\mu\text{s}$ pulse width, 300 pps)	1 A
Reverse DC Voltage	5 V
Power Dissipation <sup>(2)</sup>	75 mW

**Output Phototransistor**

Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5 V
Collector DC Current	50 mA
Power Dissipation <sup>(3)</sup>	75 mW

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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**Input IR LED (see OP168 for additional information)**

$V_F$	Forward Voltage	-	-	1.7	V	$I_F = 20 \text{ mA}$
$I_R$	Reverse Current	-	-	10	$\mu\text{A}$	$V_R = 5 \text{ V}$
$\theta$	Beam Divergence	-	90	-	Degree	$I_F = 20 \text{ mA}$

**Output Phototransistor (see OP508 for additional information)**

$V_{(BR)CEO}$	Collector Emitter Breakdown Voltage	30	-	-	V	$I_C = 100 \mu\text{A}$
$V_{(BR)ECO}$	Emitter Collector Breakdown Voltage	5	-	-	v	$I_E = 100 \mu\text{A}$
$I_{CEO}$	Collector Dark Current	-	-	100	nA	$V_{CE} = 10 \text{ V}, I_F = 0$

**Coupled Characteristics**

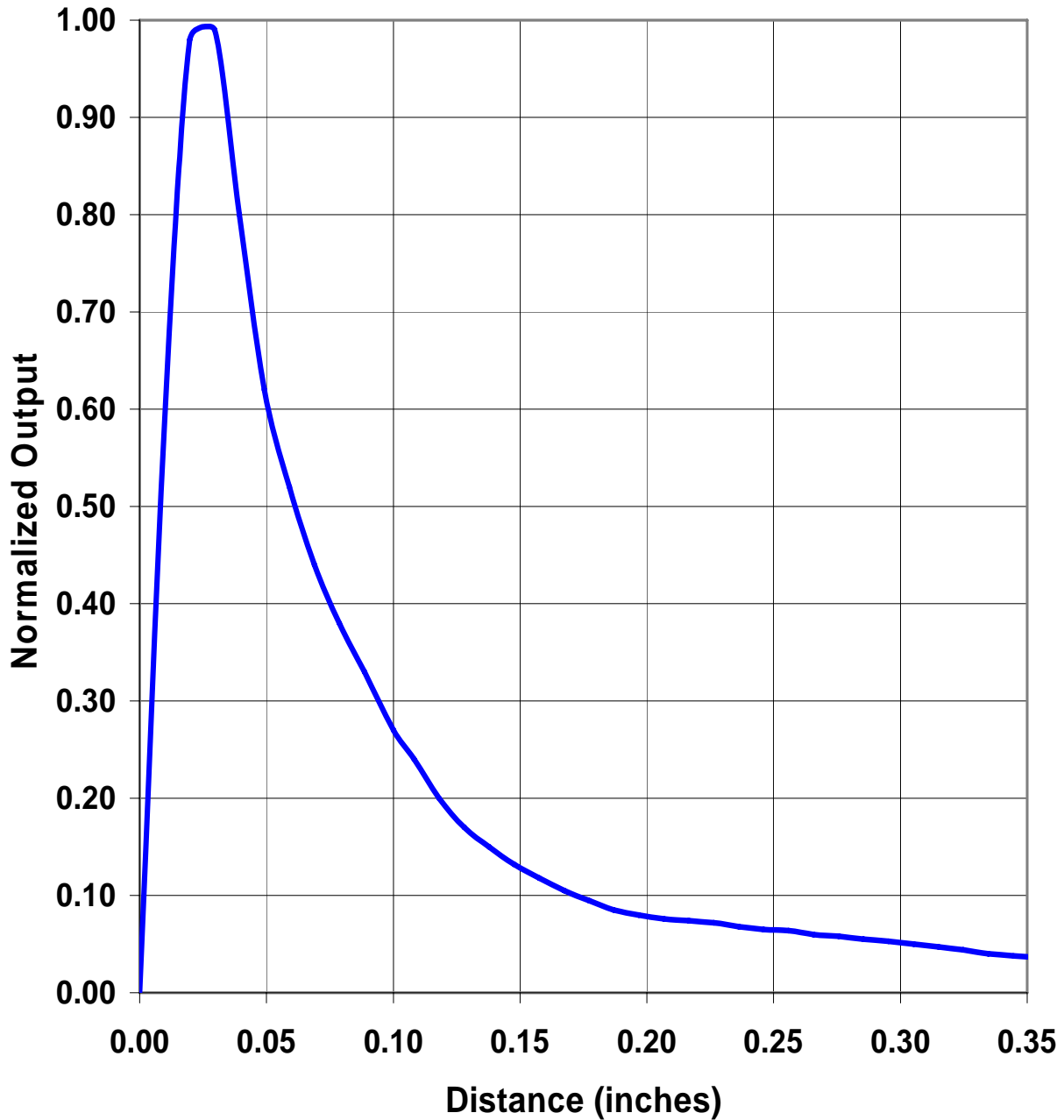
$V_{CE(SAT)}$	Collector Emitter Saturation Voltage	-	-	0.4	V	$E_E = 2.0 \text{ mW/cm}^2, I_C = 2 \text{ mA}$
$I_{C(ON)}$	On-State Collector Current	0.1	-	-	mA	$d = 0.5'' (12.7 \text{ mm})$ $I_F = 20 \text{ mA}, V_{ce} = 5 \text{ V}$
$I_{C(OFF)}$	Off-State Collector Current	-	-	200	nA	$V_{CE} = 5 \text{ V}, I_F = 20 \text{ mA}$

Notes:

1. RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
2. Derate linearly 1.25 mW/°C above 25°C.
3. Derate linearly 1.33mW/°C above 25°C.

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## OP609 - Normalized Output vs Distance



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