

# Reflective Object Sensor

OPB706A, OPB706B, OPB706C

OPB707A, OPB707B, OPB707C



## Features:

- Choice of Phototransistor (OPB706) or Photodarlington (OPB707) output
- Unfocused for sensing diffuse surface
- Low cost plastic housing
- Designed for use with PCBoards or connectors

## Description:

The **OPB706** consists of an infrared Light Emitting Diode (LED) and an NPN silicon Phototransistor mounted “side-by-side” on parallel axes in a black plastic housing. The **OPB707** consists of an infrared LED and an NPN silicon Photodarlington mounted “side-by-side” on parallel axes in a black plastic housing.

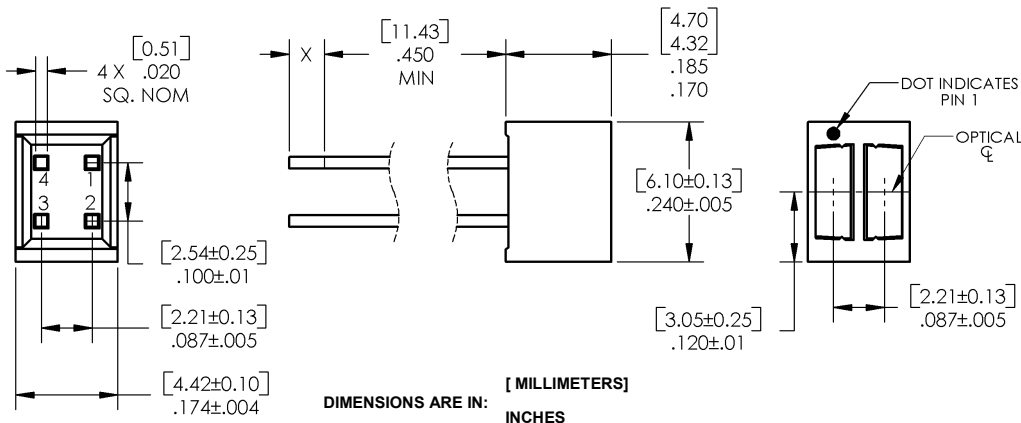
On both **OPB706** and **OPB707**, the LED and Phototransistor / Photodarlington are molded using dark infrared transmissive plastic to reduce ambient light noise. The Phototransistor / Photodarlington responds to light from the emitter when a reflective object passes within its field of view of the device.

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

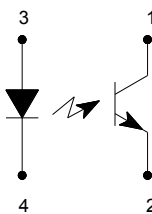
## Applications:

- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor

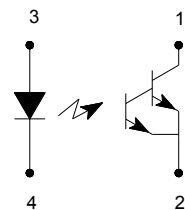
Part Number	LED Peak Wavelength	Sensor	Reflection Distance	Lead Length / Spacing
OPB706A	935 nm	Transistor	0.050" (1.27mm)	0.45" / 0.087", 0.100"
OPB706B				
OPB706C				
OPB707A		Darlington		
OPB707B				
OPB707C				



OPB706



OPB707



Pin #	LED	Pin #	Transistor
3	Anode	1	Collector
4	Cathode	2	Emitter



RoHS

General Note  
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OPTEK Technology, Inc.  
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www.optekinc.com | www.ttelectronics.com

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

Storage and Operating Temperature Range	-40° C to +85° C
Lead Soldering Temperature [1/16 inch (1.6mm) from the case for 5 sec. with soldering iron] <sup>(1)</sup>	260° C
<b>Input Diode</b>	
Forward DC Current	50 mA
Peak Forward Current (1 $\mu\text{s}$ pulse width, 300 pps)	3 A
Reverse DC Voltage	2 V
Power Dissipation <sup>(2)</sup>	75 mW
<b>Output Phototransistor (OPB706)   Output Photodarlington (OPB707)</b>	
Collector-Emitter Voltage OPB706 OPB707	24 V 15 V
Emitter-Collector Voltage	5 V
Collector DC Current OPB706 OPB707	25 mA 125 mA
Power Dissipation OPB706 <sup>(2)</sup> OPB707 <sup>(3)</sup>	75 mW 100 mW

### 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 1.67 mW/°C above 25 ° C.

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>Input Diode</b> (see OP165W for additional information)						
$V_F$	Forward Voltage	-	-	1.7	V	$I_F = 20\text{ mA}$
$I_R$	Reverse Current	-	-	100	$\mu\text{A}$	$V_R = 2\text{ V}$
<b>Output Phototransistor</b> (see OP505W for additional information)   <b>Photodarlington</b> (see OP535 for additional information)						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	24	-	-	V	$I_C = 100\ \mu\text{A}$
	OPB706	15	-	-		
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	$I_E = 100\ \mu\text{A}$
$I_{CEO}$	Collector Dark Current	-	-	100	nA	$V_{CE} = 5\text{ V}, I_F = 0, E_E \leq 0.1\ \mu\text{W}/\text{cm}^2$
	OPB706	-	-	250		
<b>Combined</b>						
$I_{CX}$	Crosstalk	-	-	200	nA	$I_F = 20\text{ mA}, V_{CE} = 5\text{ V}, \text{No reflecting surface}^{(1)}$
	OPB706	-	-	10	$\mu\text{A}$	
$I_{C(ON)}$	On-State Collector Current	500	-	-	$\mu\text{A}$	$I_F = 20\text{ mA}, V_{CE} = 5\text{ V}, d = 0.05'' (1.27\text{ mm})^{(2)(3)}$
	OPB706A	350	-	-		
	OPB706B	250	-	-		
	OPB706C	25	-	-	mA	
	OPB707A	17	-	-		
	OPB707B	10	-	-		
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	0.4	-	-	V	$I_F = 20\text{ mA}, d = 0.05'' (1.27\text{ mm})^{(2)(3)}$ $I_{C(ON)} = 100\ \mu\text{A}$ $I_{C(ON)} = 2\text{ mA}$
	OPB706	1.1	-	-		
	OPB707					

### Notes:

- (1) Crosstalk ( $I_{CX}$ ) is the collector current measured with the indicated current in the input diode and with no reflecting surface.
- (2) The distance from the assembly face to the reflective surface is "d".
- (3) Measured using Eastman Kodak neutral white test card with 90% diffuse reflectance as a reflecting surface. Reference: Eastman Kodak, Catalog #E 152 7795.
- (4) Lower curve is a calculated worst case condition rather than the conventional  $-2\ \Omega$  limit.
- (5) All parameters tested using pulse techniques.

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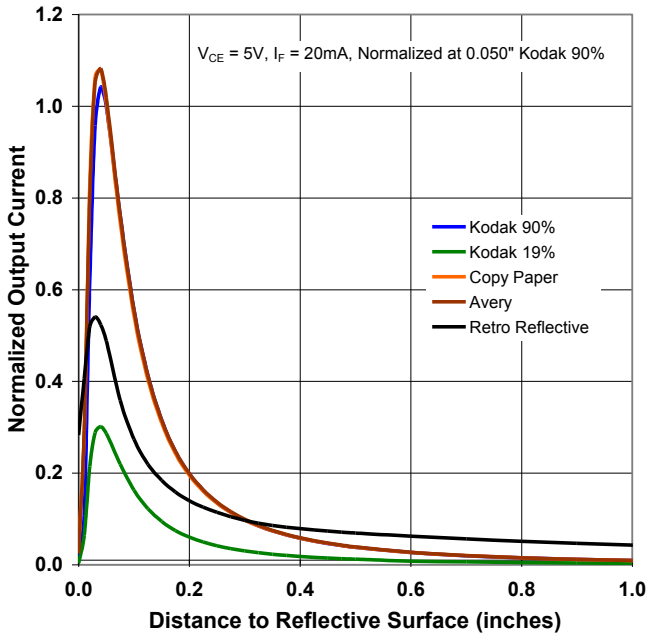
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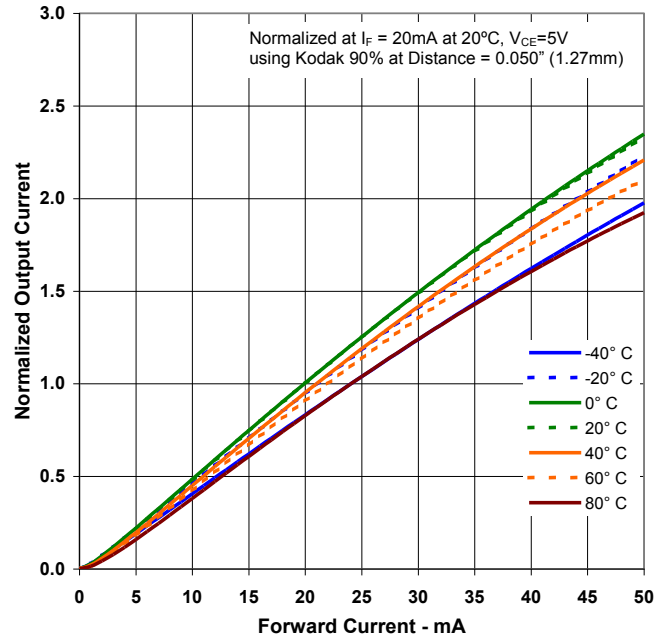
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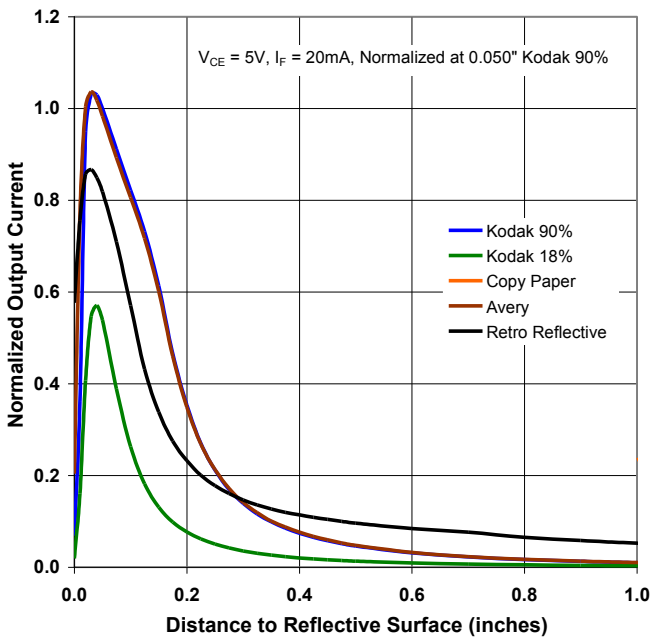
**OPB706 - Normalized Collector Current vs. Object Distance**



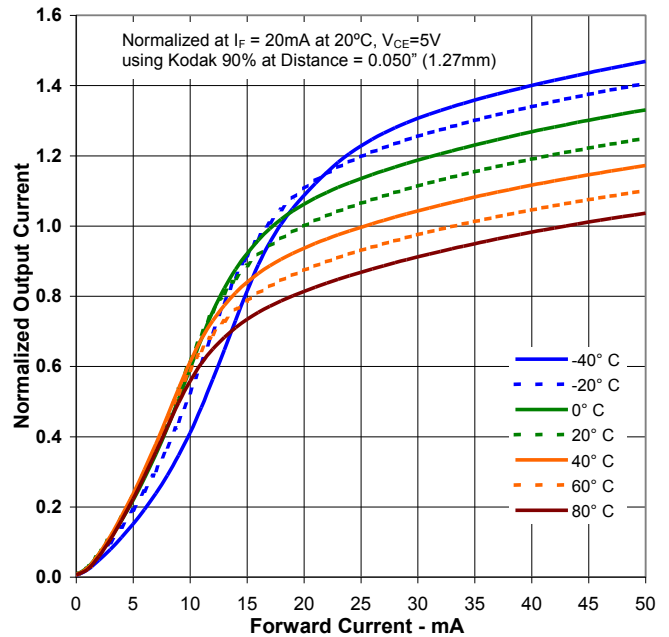
**OPB706 - Output Current vs Forward Current vs Temperature**



**OPB707 - Normalized Collector Current vs. Object Distance**



**OPB707 - Output Current vs Forward Current vs Temperature**



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