

# Reflective Object Sensor

OPB706A, OPB706B, OPB706C  
OPB707A, OPB707C

Obsolete (OPB707B)



## 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.

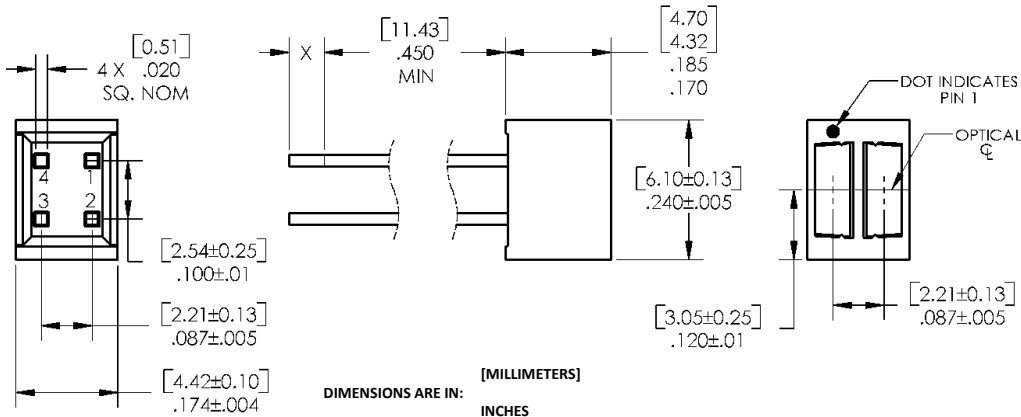
On both **OPB706** and **OPB707**, the LED and Phototransistor / Photodarlington are molded using dark infrared transmissive plastic to reduce ambient light noise. The Phototransistor / Photodarlington responds to light from the emitter when a reflective object passes within its field of view of the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

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

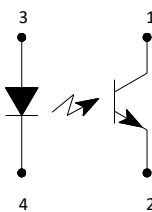
## Applications:

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

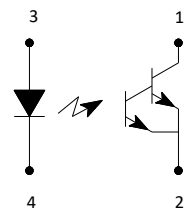
Part Number	LED Peak Wavelength	Sensor	Reflection Distance	Lead Length / Spacing
OPB706A	935 nm	Transistor	0.050" (1.27mm)	0.45" / 0.087", 0.100"
OPB706B				
OPB706C				
OPB707A		Darlington		
OPB707B Obsolete				
OPB707C				



OPB706



OPB707



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



RoHS

### General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

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## Electrical Specifications

### 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 (1.6 mm) from the case for 5 sec. with soldering iron] <sup>(1)</sup>	260° C

### Input Diode

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

### Output Phototransistor (OPB706) | Output Photodarlington (OPB707)

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 Specifications

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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**Input Diode** (see OP165W for additional information)

$V_F$	Forward Voltage	-	-	1.7	V	$I_F = 20 \text{ mA}$
$I_R$	Reverse Current	-	-	100	$\mu\text{A}$	$V_R = 2 \text{ V}$

**Output Phototransistor** (see OP505W for additional information) | **Photodarlington** (see OP535 for additional information)

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage					
	OPB706	24	-	-	V	$I_C = 100 \mu\text{A}$
	OPB707	15	-	-		
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	$I_E = 100 \mu\text{A}$
$I_{CEO}$	Collector Dark Current					
	OPB706	-	-	100	nA	$V_{CE} = 5 \text{ V}, I_F = 0, E_E \leq 0.1 \mu\text{W}/\text{cm}^2$
	OPB707	-	-	250		

**Combined**

$I_{CX}$	Crosstalk					$I_F = 20 \text{ mA}, V_{CE} = 5 \text{ V}, \text{No reflecting surface}^{(1)}$
	OPB706	-	-	200	nA	
	OPB707	-	-	10	$\mu\text{A}$	
$I_{C(ON)}$	On-State Collector Current					$I_F = 20 \text{ mA}, V_{CE} = 5 \text{ V}, d = 0.05'' (1.27 \text{ mm})^{(2)(3)}$
	OPB706A	500	-	-	$\mu\text{A}$	
	OPB706B	350	-	-		
	OPB706C	250	-	-		
	OPB707A	25	-	-	mA	
	OPB707C	10	-	-		
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage					$I_F = 20 \text{ mA}, d = 0.05'' (1.27 \text{ mm})^{(2)(3)}$
	OPB706	0.4	-	-	V	$I_{C(ON)} = 100 \mu\text{A}$
	OPB707	1.1	-	-		$I_{C(ON)} = 2 \text{ mA}$

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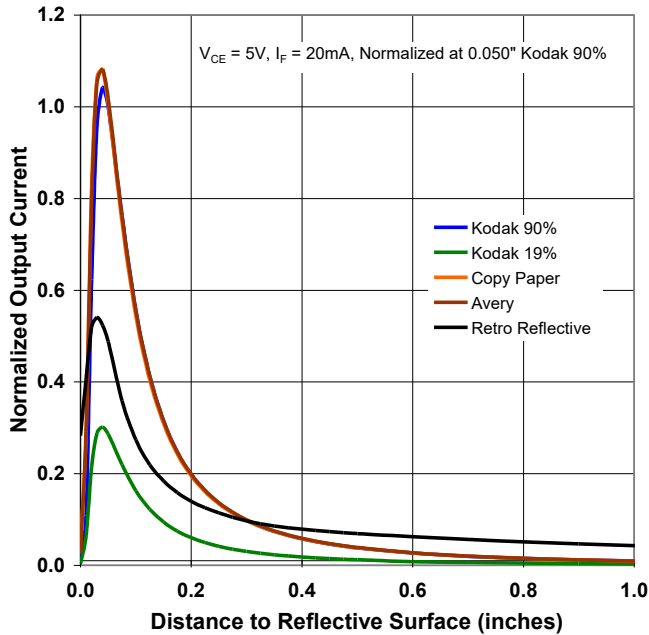
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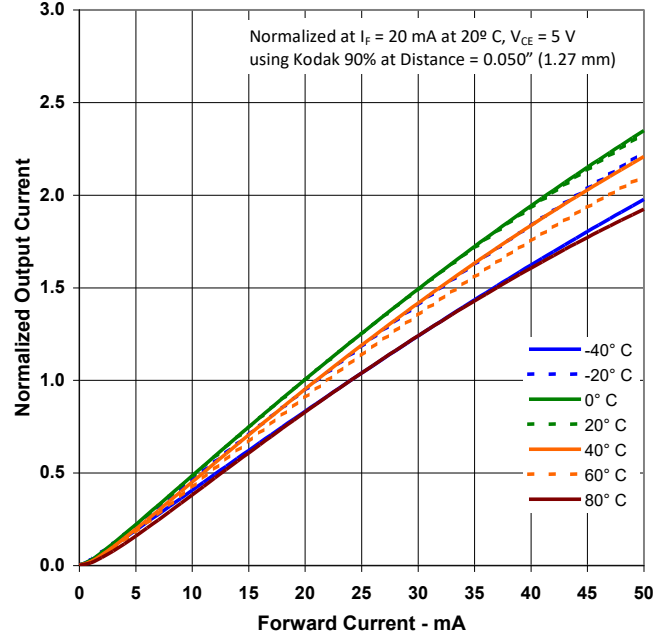
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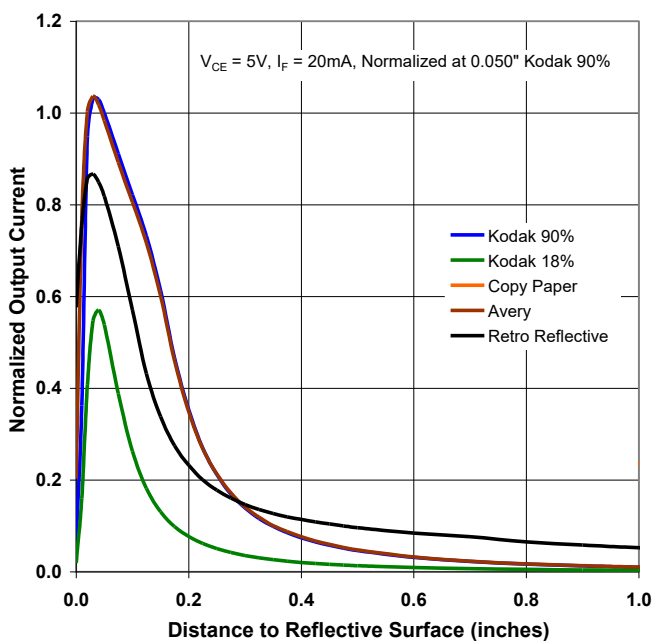
**OPB706 - Normalized Collector Current vs. Object Distance**



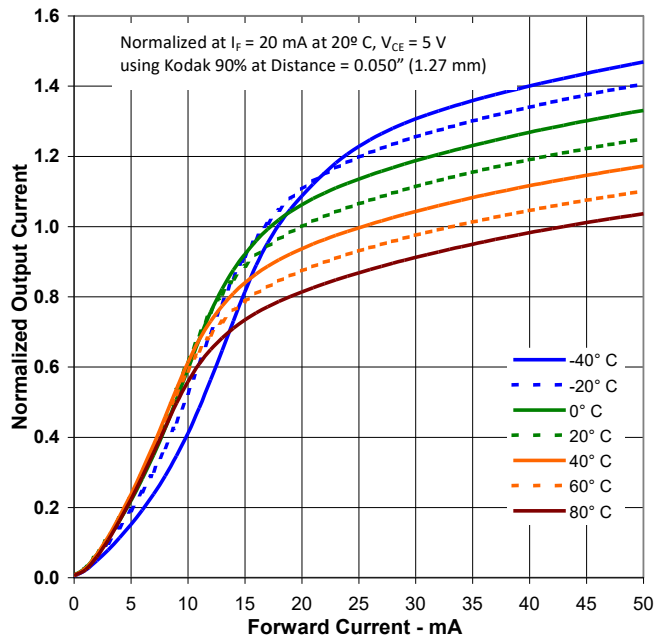
**OPB706 - Output Current vs Forward Current vs Temperature**



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



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



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