

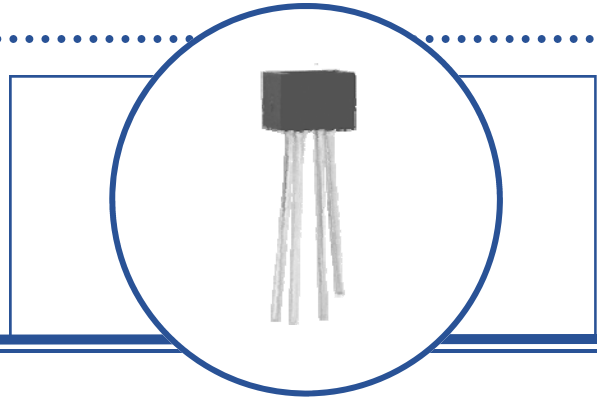
Reflective Object Sensor

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.

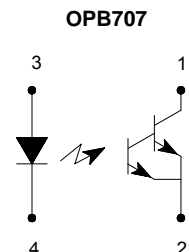
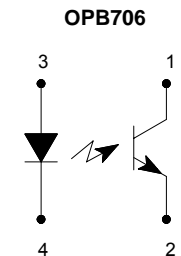
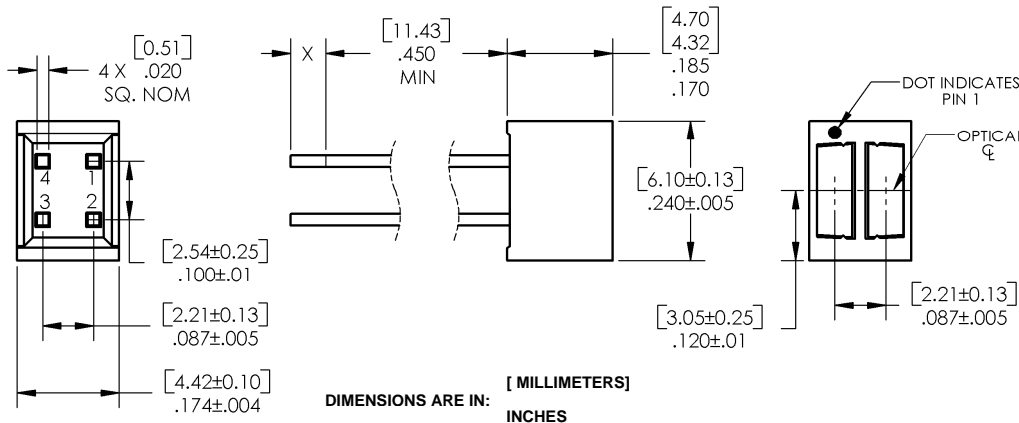
On both **OPB706** and **OPB707**, the LED and Phototransistor / Photodarlington are molded using dark infrared transmissive plastic to reduce ambient light noise. The Phototransistor / Photodarlington responds to light from the emitter when a reflective object passes within its field of view of the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



RoHS

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

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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] ⁽¹⁾	260° C

Input Diode

Forward DC Current	50 mA
Peak Forward Current (1 μs pulse width, 300 pps)	3 A
Reverse DC Voltage	2 V
Power Dissipation ⁽²⁾	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 ⁽²⁾ OPB707 ⁽³⁾	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
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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	μA	$V_R = 2\text{ V}$

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

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

Combined

I_{CX}	Crosstalk OPB706 OPB707	- -	- -	200 10	mA μA	$I_F = 20\text{ mA}, V_{CE} = 5\text{ V}, \text{No reflecting surface}^{(1)}$
$I_{C(ON)}$	On-State Collector Current OPB706A OPB706B OPB706C OPB707A OPB707B OPB707C	500 350 250 25 17 10	- - - - - -	- - - - - -	μA mA	$I_F = 20\text{ mA}, V_{CE} = 5\text{ V}, d = 0.05'' (1.27\text{ mm})^{(2)(3)}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage OPB706 OPB707	0.4 1.1	- -	- -	V	$I_F = 20\text{ mA}, d = 0.05'' (1.27\text{ mm})^{(2)(3)}$ $I_{C(ON)} = 100\ \mu\text{A}$ $I_{C(ON)} = 2\text{ mA}$

Notes:

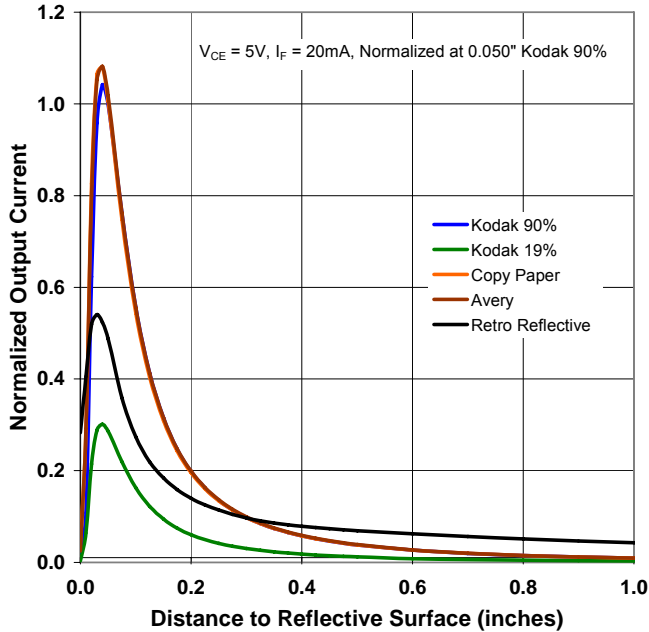
- (1) Crosstalk (I_{CX}) is the collector current measured with the indicated current in the input diode and with no reflecting surface.
- (2) The distance from the assembly face to the reflective surface is "d".
- (3) Measured using Eastman Kodak neutral white test card with 90% diffuse reflectance 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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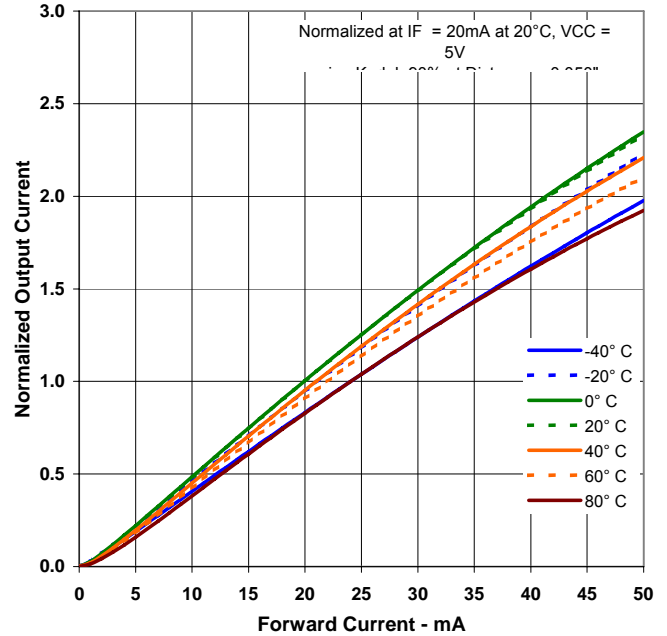
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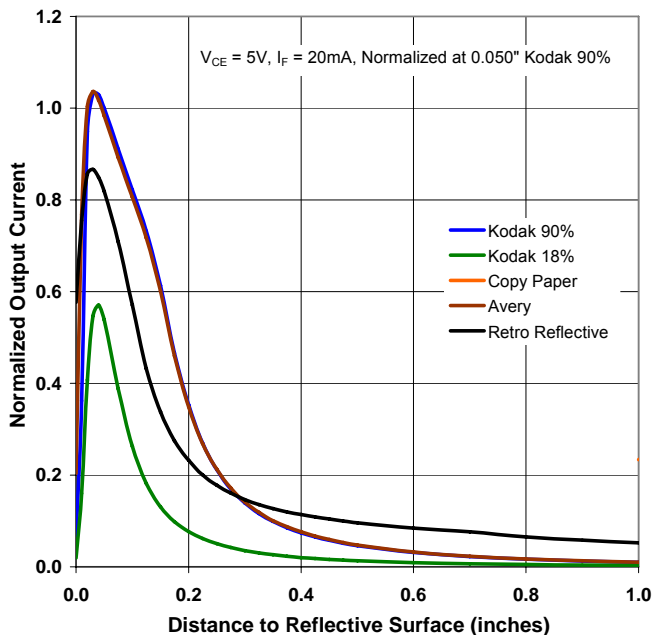
OPB706 - Normalized Collector Current vs. Object Distance



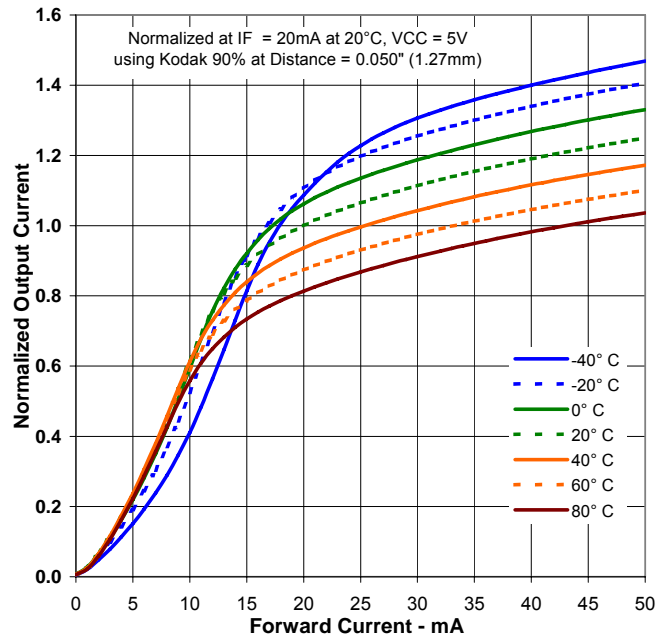
OPB706 - Output Current vs Forward Current vs Temperature



OPB707 - Normalized Collector Current vs. Object Distance



OPB707 - Output Current vs Forward Current vs Temperature



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