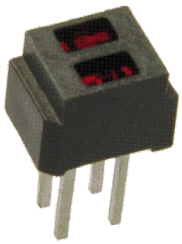
Reflective Object Sensor

OPB606A, OPB606B, OPB606C
OPB607A, OPB607C



Features:

- Choice of phototransistor (OPB606) or photodarlington (OPB607) output
- Unfocused for sensing diffuse surface
- Low-cost plastic housing
- Filtered to reduce effects of ambient light (OPB606, OPB607)

Description:

OPB606 consists of an infrared Light Emitting Diode (LED) and an NPN silicon phototransistor which are mounted “side-by-side” on parallel axes in a black opaque plastic housing.

The **OPB607** consists of an infrared Light Emitting Diode (LED) and an NPN silicon photodarlington which are mounted “side-by-side” on parallel axes in a black plastic housing.

The emitting diode and phototransistor of both the **OPB606** and **OPB607** are encapsulated in a filtering epoxy that reduces ambient light noise. On both models, the phototransistors respond to radiation from the emitter only when a reflective object passes within the field of view.

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

Applications:

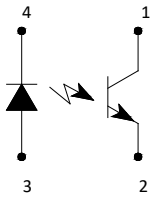
- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor

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

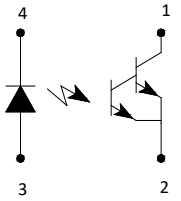
Ordering Information

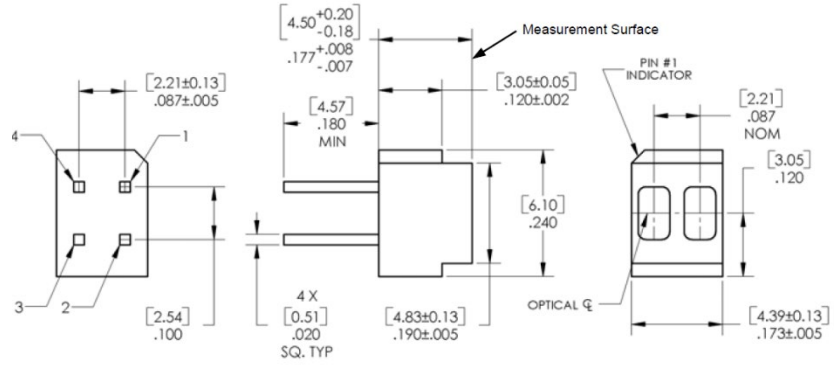
Part Number	LED Peak Wavelength	Sensor	Typical Reflection Distance Inch (mm)	Lead Length
OPB606A	935 nm	Transistor	0.050" (1.27 mm)	0.18” (Min)
OPB606B				
OPB606C				
OPB607A		Darlington		
OPB607C				

OPB606



OPB607





DIMENSIONS ARE IN: [MILLIMETERS] INCHES

RoHS

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.

Electrical Specifications

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Storage & 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] (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 (OPB606) / Output Photodarlington (OPB607)	
Collector-Emitter Voltage	
OPB606A, OPB606B, OPB606C	30 V
OPB607A, OPB607C	15 V
Emitter-Collector Voltage	5 V
Collector DC Current	
OPB606A, OPB606B, OPB606C	25 mA
OPB607A, OPB607C	125 mA
Power Dissipation (2)	75 mW

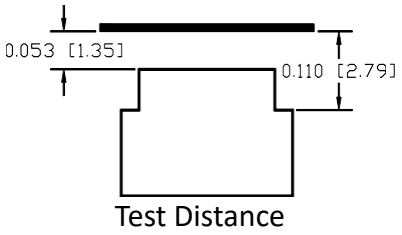
Notes:
(1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
(2) Derate linearly 0.92 mW/° C above 25° C.

Electrical Specifications

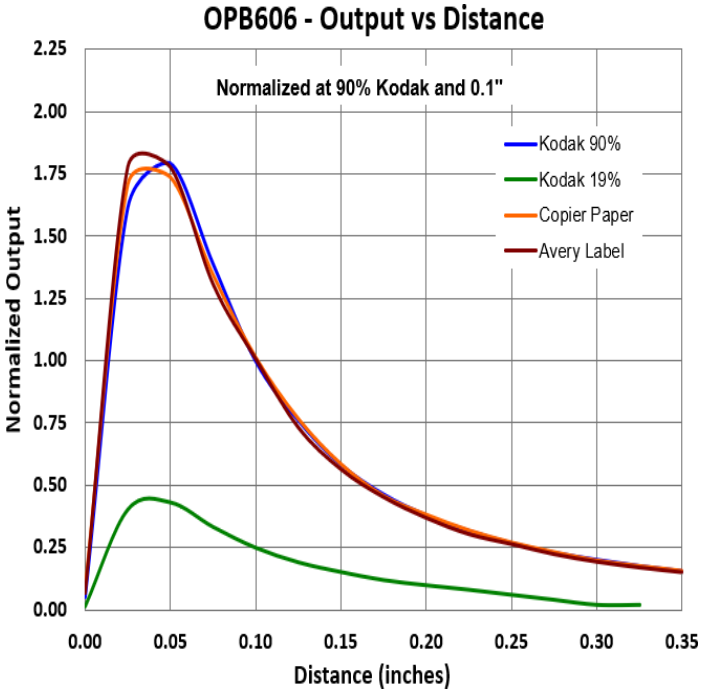
Electrical Characteristics (T_A = 25° C unless otherwise noted) (4)

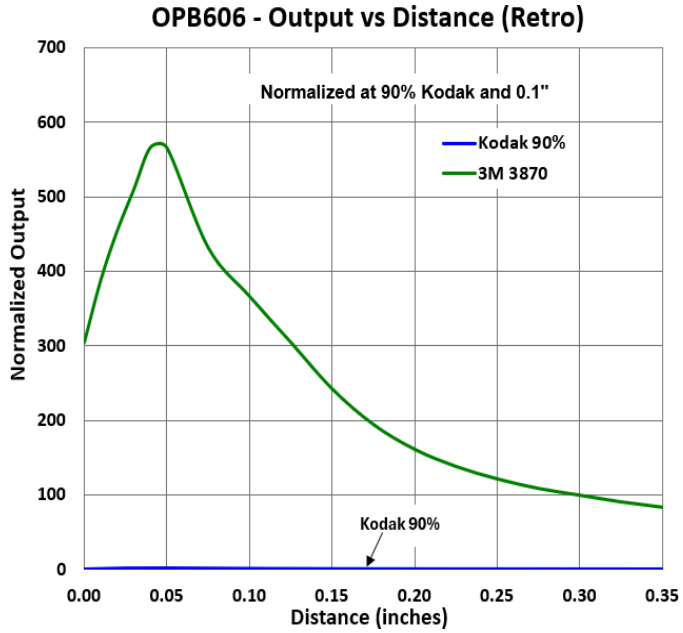
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage	1.0	-	1.7	V	I_F = 20 mA
I_R	Reverse Current	-	-	100	µA	V_R = 2 V
Output Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage OPB606 OPB607	 30 15	 - -	 - -	 V V	I_C = 100 µA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	I_E = 100 µA
I_{CEO}	Collector Dark Current OPB606 OPB607	 - -	 - -	 100 250	 nA nA	V_{CE} = 5 V, I_F = 0
Combined						
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage OPB606 OPB607	 - -	 - -	 0.4 1.1	 V	I_F = 20 mA, I_C = 100 µA, d = 0.053" (1.45 mm) (1)(2) I_F = 20 mA, I_C = 2 mA, d = 0.053" (1.45 mm) (1)(2)
$I_{C(ON)}$	On-State Collector Current OPB606A OPB606B OPB606C OPB607A OPB607C	 500 350 200 25 10	 - - - - -	 - - - - -	 µA µA µA mA mA	I_F = 20 mA, V_{CE} = 5 V, d = 0.053" (1.45 mm) (1)(2)
$I_{C(OFF)}$	Off-State Collector Current OPB606 OPB607	 - -	 - -	 200 10	 nA µA	V_{CE} = 5 V, I_F = 20 mA (3) V_{CE} = 5 V, I_F = 20 mA (3)

Notes:
(1) "d" is the distance from the assembly measurement surface to the reflective surface.
(2) Measured using Eastman Kodak neutral white test card with 90% diffuse reflectance as a reflecting surface. Reference: Eastman Kodak, Catalog # E 152 7795.
(3) On OPB606, off-state collector current $I_{C(OFF)}$ is measured with no reflective surface in the optical path. On OPB607, Crosstalk (I_{cx}) is the collector current measured with the indicated current in the input diode and with no reflecting surface.
(4) All parameters tested using pulse techniques.



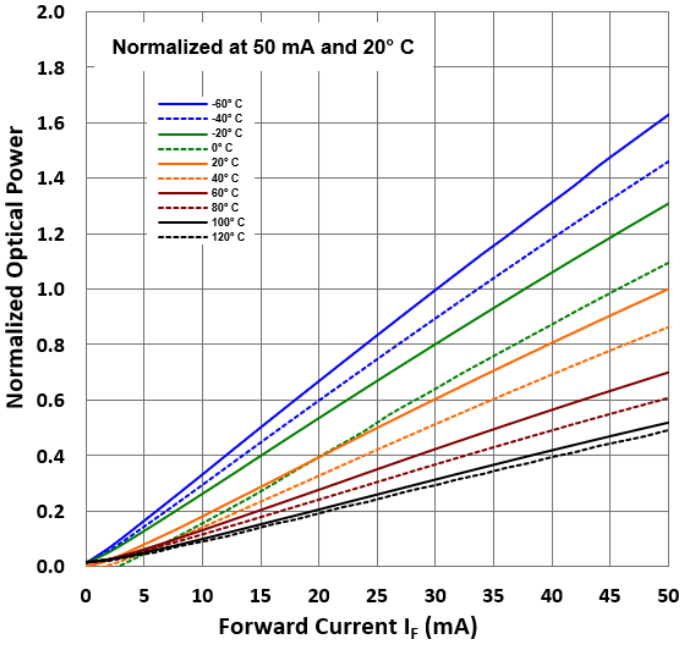
Typical Performance



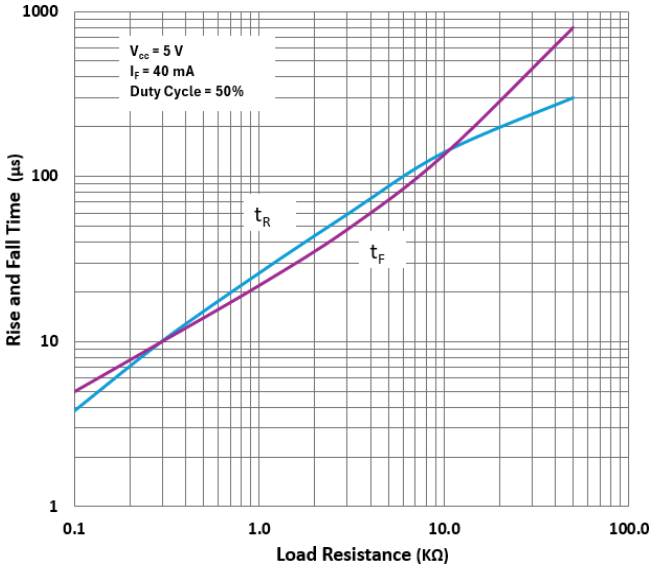


Typical Performance

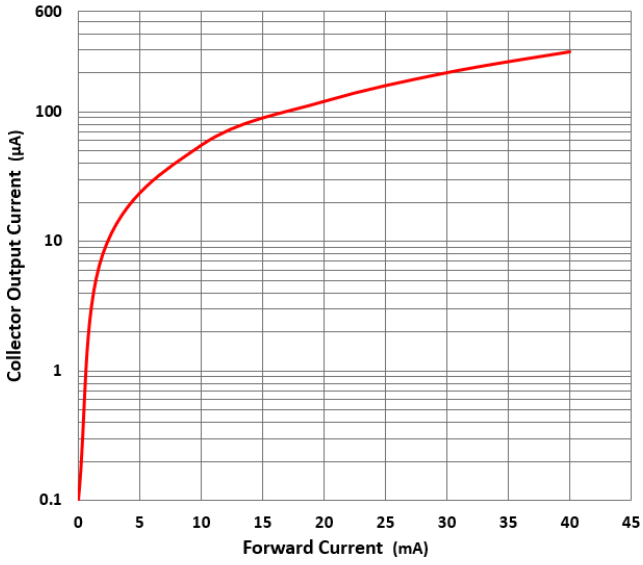
Optical Power vs I_F vs Temperature



Transistor Output - Rise and Fall Time

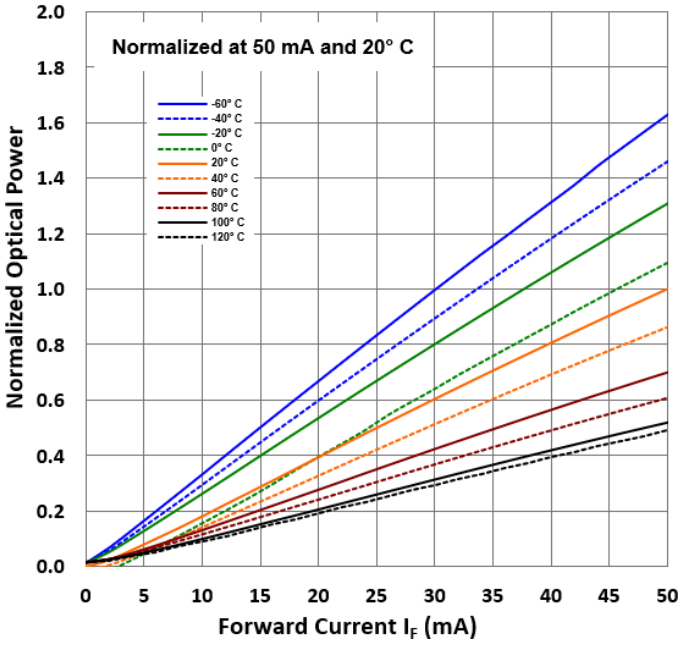


Output Current vs LED Forward Current

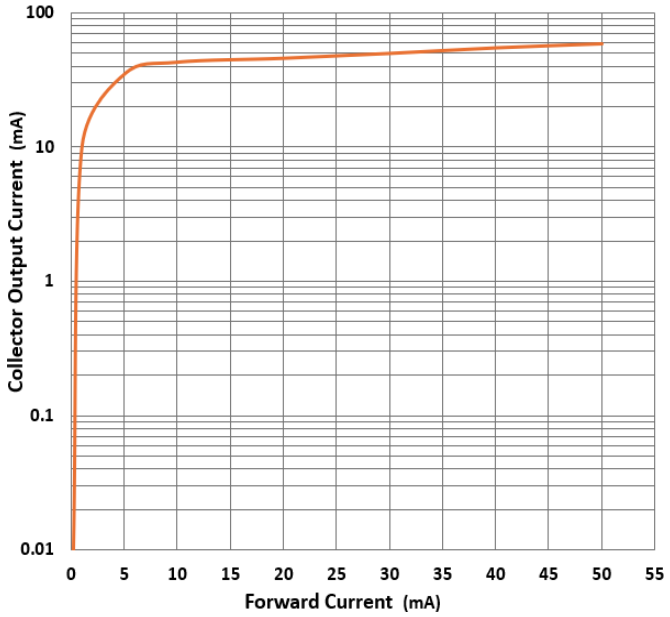


Typical Performance

Optical Power vs I_F vs Temperature



Darlington Output Current vs LED Current



Darlington Output - Rise and Fall Time