

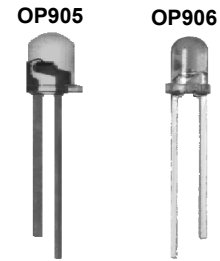
# PIN Silicon Photodiode

OP905, OP906



## Features:

- Clear epoxy package
- Linear response vs. irradiance
- Fast switching time
- Narrow receiving angle
- T-1 package style
- Small package style ideal for space-limited applications



## Description:

Each **OP905** and **OP906** device consists of a PIN silicon photodiode molded in a clear epoxy package that allows spectral response from visible to infrared light wavelengths. The T-1 package style is ideal for space-limited applications. Both devices have a narrow receiving angle, which provides excellent on-axis coupling. Both are also 100% production tested using infrared light for close correlation with OPTEK's GaAs and GaAlAs emitters.

*Please refer to Application Bulletins 208 and 210 for additional design information and reliability (degradation) data.*

## Applications:

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

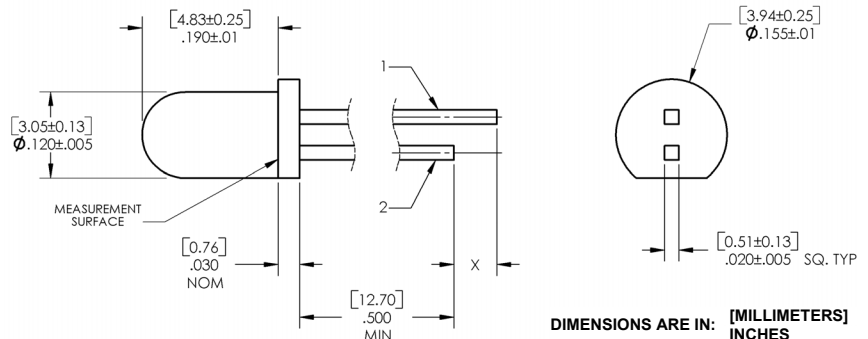
Ordering Information			
Part Number	Sensor	Viewing Angle	Lead Length
<b>OP905</b>	Photodiode	95°	0.50"
<b>OP906</b>			

Pin #	Diode
1	Anode
2	Cathode

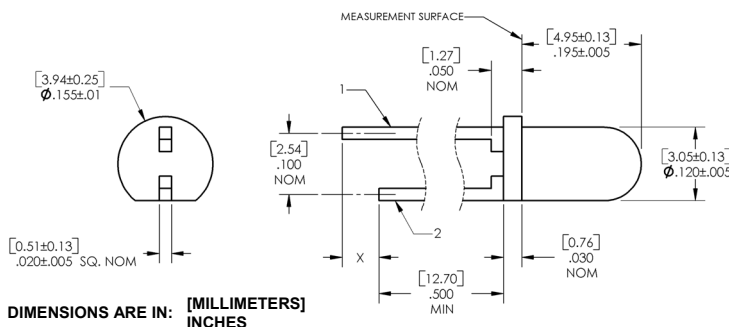
OP905 - OP906



OP905



OP906



RoHS

DIMENSIONS ARE IN: [MILLIMETERS]  
INCHES

**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.

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.

OPTEK Technology, Inc.  
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### Electrical Specifications

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

Reverse Breakdown Voltage	60 V
Storage & Operating Temperature Range	$-40^\circ \text{C}$ to $+100^\circ \text{C}$
Lead Soldering Temperature [1/16 inch (1.6mm) from the case for 5 sec. with soldering iron]	$260^\circ \text{C}^{(1)}$
Reverse Breakdown Voltage	60 V
Power Dissipation	$100 \text{ mW}^{(2)}$

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
$I_L$	Reverse Light Current					
	OP905	14	-	32	$\mu\text{A}$	$V_R = 5 \text{ V}$ , $E_E = 0.50 \text{ mW/cm}^2^{(3)}$
	OP906	16	-	35		
$I_D$	Reverse Dark Current	-	1	60	nA	$V_R = 30 \text{ V}$ , $E_E = 0^{(4)}$
$V_{(BR)}$	Reverse Breakdown Voltage	60	-	-	V	$I_R = 100 \mu\text{A}$
$V_F$	Forward Voltage	-	-	1.2	V	$I_F = 1 \text{ mA}$
$C_T$	Total Capacitance	-	4	-	pF	$V_R = 20 \text{ V}$ , $E_E = 0$ , $f = 1.0 \text{ MHz}$
$t_r$	Rise Time	-	5	-	ns	$V_R = 20 \text{ V}$ , $\lambda = 850 \text{ nm}$ , $R_L = 50 \Omega$
$t_f$	Fall Time	-	5	-		

#### Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering. A maximum of 20 grams force may be applied to leads when soldering.
- (2) Derate linearly  $1.67 \text{ mW}/^\circ \text{C}$  above  $25^\circ \text{C}$ .
- (3) Light source is an unfiltered GaAs LED with a peak emission wavelength of 935 nm and a radiometric intensity level which varies less than 10% over the entire lens surface of the photodiode being tested.
- (4) Calculate the typical dark current in nA using the formula  $I_D = 10^{(0.042T_A - 1.5)}$  where  $T_A$  is ambient temperature in  $^\circ \text{C}$ .

# PIN Silicon Photodiode

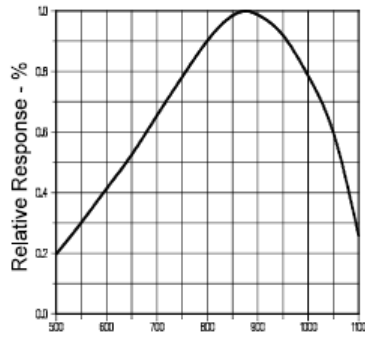
OP905, OP906



## Performance

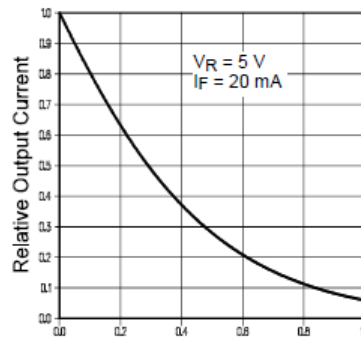
OP905

Relative Response vs. Wavelength



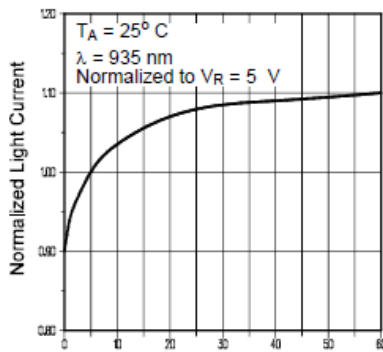
$\lambda$  - Wavelength - nm

Coupling Characteristics  
OP905 and OP265



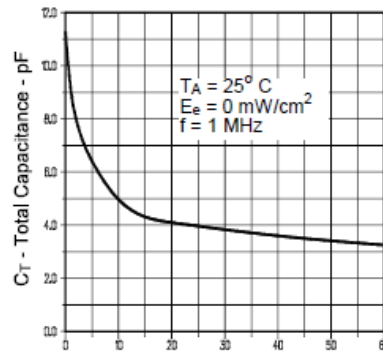
Distance Between Lens Tips - inches

Normalized Light Current vs Reverse Voltage



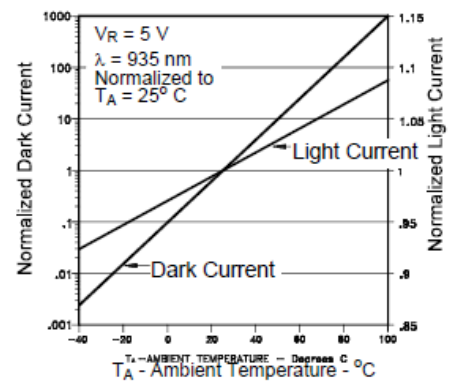
$V_R$  - Reverse Voltage - V

Total Capacitance vs Reverse Voltage

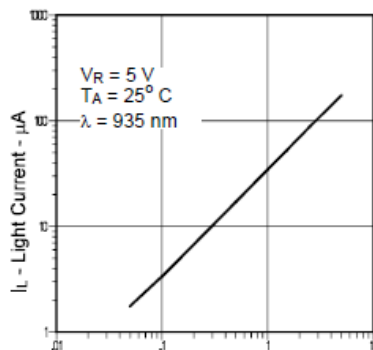


$V_R$  - Reverse Voltage - V

Normalized Light and Dark Current vs Ambient Temperature

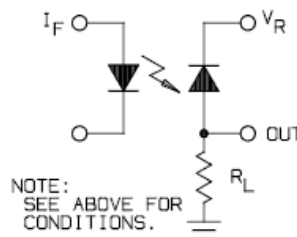


Light Current vs. Irradiance

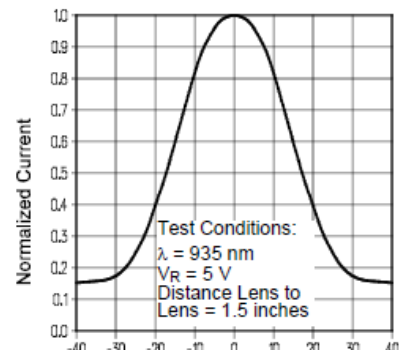


$E_e$  - Irradiance - mW/cm<sup>2</sup>

Switching Time Test Circuit



Light Current vs. Angular Displacement



$\theta$  - Angular Displacement - Deg.

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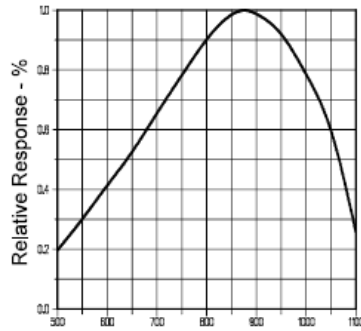
OP905, OP906



## Performance

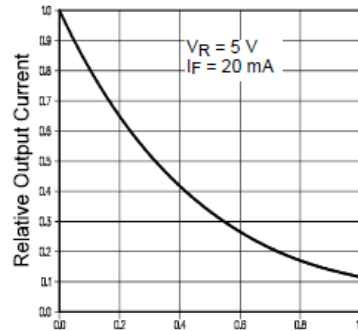
OP906

Relative Response vs. Wavelength



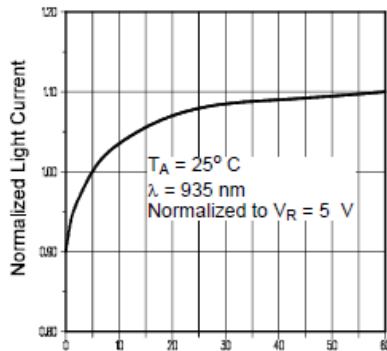
$\lambda$  - Wavelength - nm

Coupling Characteristics  
OP906 and OP266



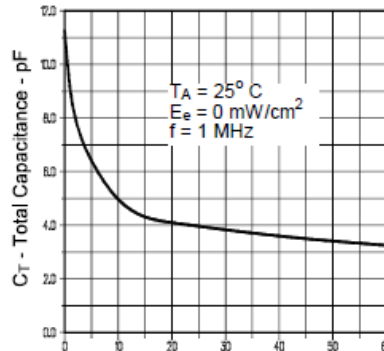
Distance Between Lens Tips - inches

Normalized Light Current vs. Reverse Voltage



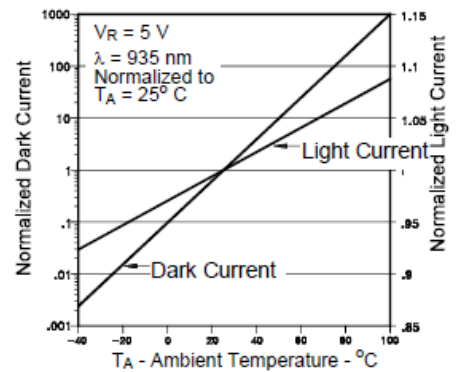
$V_R$  - Reverse Voltage - V

Total Capacitance vs. Reverse Voltage

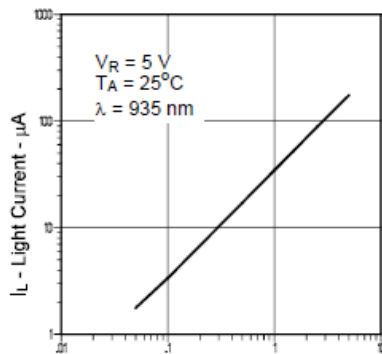


$V_R$  - Reverse Voltage - V

Normalized Light and Dark Current vs. Ambient Temperature

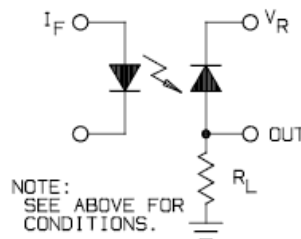


Light Current vs. Irradiance

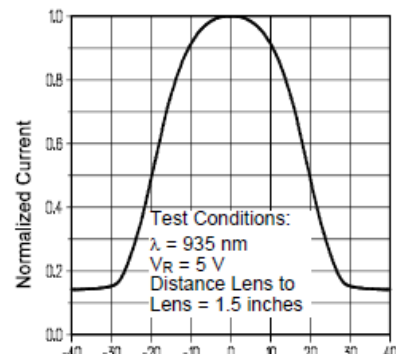


$E_e$  - Irradiance -  $\text{mW}/\text{cm}^2$

Switching Time Test Circuit



Light Current vs. Angular Displacement



$\theta$  - Angular Displacement - Deg.

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