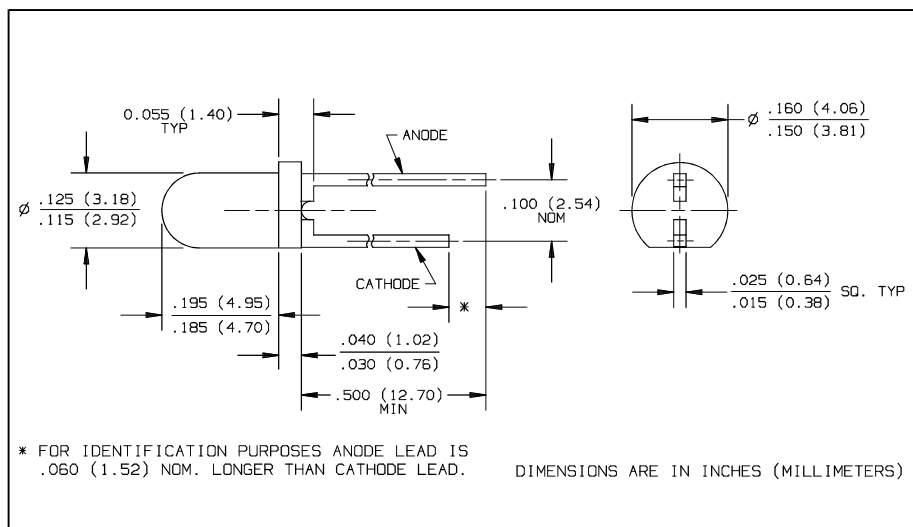


# PIN Silicon Photodiode

## Type OP906



### Features

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

### Description

The OP906 device consists of a PIN silicon photodiode molded in a clear epoxy package which allows spectral response from visible to infrared light wavelengths. The narrow receiving angle provides excellent on-axis coupling. These devices are 100% production tested using infrared light for close correlation with Optek's GaAs and GaAlAs emitters. Lead spacing is 0.100 inch (2.54 mm).

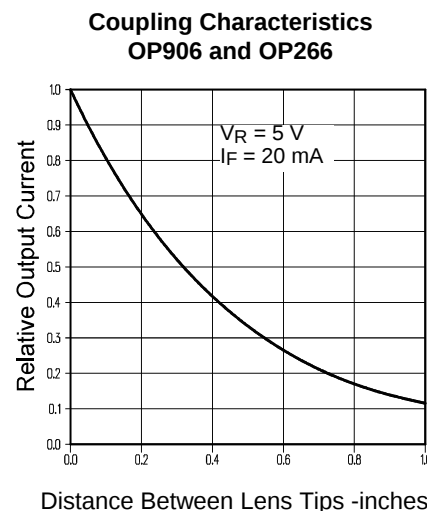
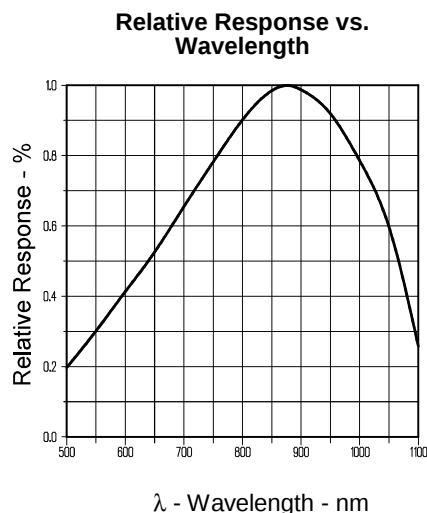
### Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

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

#### Notes:

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

### Typical Performance Curves



# Type OP906

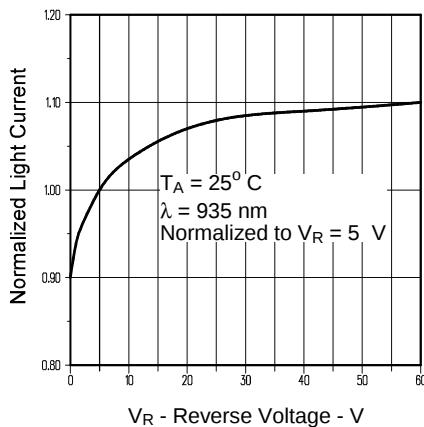
**Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

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

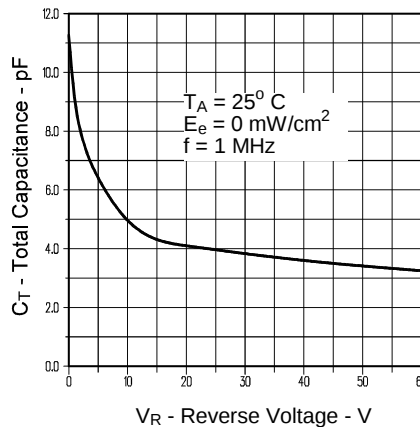
## Typical Performance Curves

PHOTOSENSORS

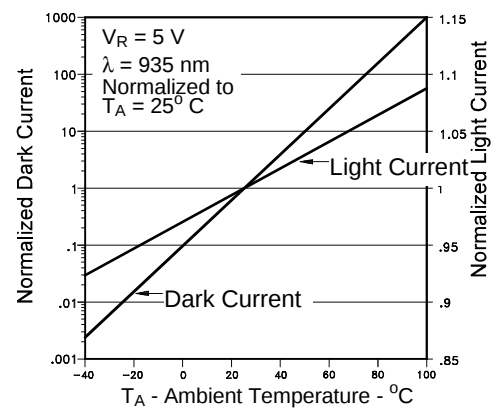
**Normalized Light Current vs Reverse Voltage**



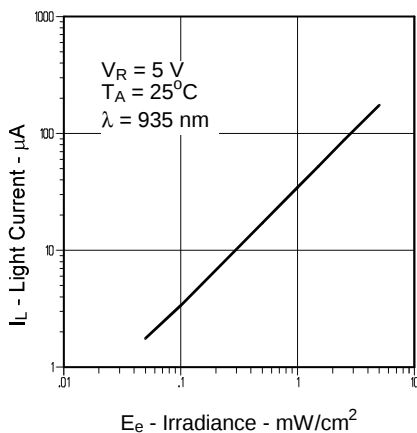
**Total Capacitance vs Reverse Voltage**



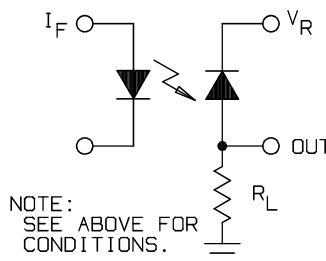
**Normalized Light and Dark Current vs Ambient Temperature**



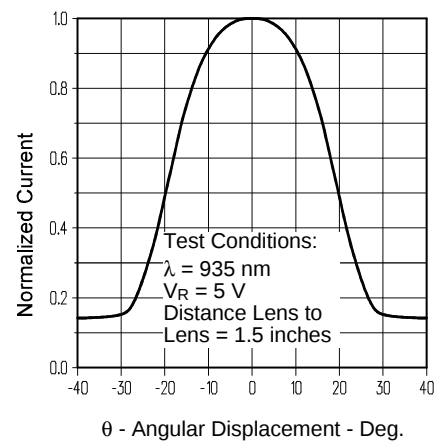
**Light Current vs. Irradiance**



**Switching Time Test Circuit**



**Light Current vs. Angular Displacement**



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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