**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** ($T_A = 25^\circ C$ unless otherwise noted)

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

**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$/^\circ$ C above 25$^\circ$ 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 $I_D = 10^{(0.042 T_A - 1.75)}$ where $T_A$ is ambient temperature in $^\circ$ C.

**Typical Performance Curves**

**Relative Response vs. Wavelength**

**Coupling Characteristics**

**OP906 and OP266**

**Notes:**
- For identification purposes, anode lead is .060 (1.52) Nm. longer than cathode lead.
- Dimensions are in inches (millimeters).
Type OP906

Electrical Characteristics (\(T_A = 25^\circ C\) unless otherwise noted)

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

### Typical Performance Curves

- **Normalized Light Current vs Reverse Voltage**
  - \(V_R\) - Reverse Voltage
  - \(TA = 25^\circ C\)
  - \(\lambda = 935 \text{ nm}\)
  - Normalized to \(V_R = 5 \text{ V}\)

- **Total Capacitance vs Reverse Voltage**
  - \(C_T\) - Total Capacitance
  - \(TA = 25^\circ C\)
  - \(E_\theta = 0 \text{ mW/cm}^2\)
  - \(f = 1 \text{ MHz}\)

- **Normalized Light and Dark Current vs Ambient Temperature**
  - \(V_R = 5 \text{ V}\)
  - \(\lambda = 935 \text{ nm}\)
  - Normalized to \(TA = 25^\circ C\)
  - Light Current
  - Dark Current

- **Light Current vs. Irradiance**
  - \(V_R = 5 \text{ V}\)
  - \(TA = 25^\circ C\)
  - \(\lambda = 935 \text{ nm}\)

- **Switching Time Test Circuit**
  - \(I_F\)
  - \(V_R\)
  - \(R_L\)

- **Light Current vs. Angular Displacement**
  - \(\theta\) - Angular Displacement
  - \(\lambda = 935 \text{ nm}\)
  - \(V_R = 5 \text{ V}\)
  - Distance Lens to Lens = 1.5 inches

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

Optek Technology, Inc. 1215 W. Crosby Road Carrollton, Texas 75006 (972)323-2200 Fax (972)323-2396

3-55