S3759 is a Si PIN photodiode developed to detect and measure infrared energy emitted from YAG lasers (1.06 μm). Compared to standard Si photodiodes, S3759 delivers exceptionally high sensitivity of 0.38 A/W at 1.06 μm. The PIN structure allows high-speed response and low capacitance. The active area is as large as $\phi 5$ mm, making optical axis alignment easier.

### Features
- High sensitivity in infrared region: 0.38 A/W ($\lambda=1.06$ μm)
- High-speed response: $t_r=12.5$ ns ($V_r=100$ V)
- Low capacitance: $C_t=10$ pF ($V_r=100$ V)
- Large active area: $\phi 5$ mm
- High reliability: TO-8 metal package

### Applications
- YAG laser detection
- Analytical equipment, etc

### Absolute maximum ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum reverse voltage</td>
<td>$V_r \text{max}$</td>
<td>150</td>
<td>V</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>$T_{opr}$</td>
<td>-40 to +100</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>$T_{stg}$</td>
<td>-55 to +125</td>
<td>°C</td>
</tr>
</tbody>
</table>

Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

### Electrical and optical characteristics ($T_a=25$ °C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Condition</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spectral response range</td>
<td>$\lambda$</td>
<td></td>
<td>360 to 1120</td>
<td>-</td>
<td>-</td>
<td>nm</td>
</tr>
<tr>
<td>Peak sensitivity wavelength</td>
<td>$\lambda_p$</td>
<td>$\lambda=1060$ nm</td>
<td>-</td>
<td>980</td>
<td>-</td>
<td>nm</td>
</tr>
<tr>
<td>Photo sensitivity</td>
<td>$S$</td>
<td>$\lambda=1060$ nm</td>
<td>0.3</td>
<td>0.38</td>
<td>-</td>
<td>A/W</td>
</tr>
<tr>
<td>Short circuit current</td>
<td>$I_{sc}$</td>
<td>2856 K, 1000 lx</td>
<td>14</td>
<td>19</td>
<td>-</td>
<td>μA</td>
</tr>
<tr>
<td>Dark current</td>
<td>$I_d$</td>
<td>$V_r=100$ V</td>
<td>-</td>
<td>1</td>
<td>10</td>
<td>nA</td>
</tr>
<tr>
<td>Rise time</td>
<td>$t_r$</td>
<td>$\lambda=1060$ nm, $V_r=100$ V, $R_L=50$ Ω</td>
<td>-</td>
<td>12.5</td>
<td>-</td>
<td>ns</td>
</tr>
<tr>
<td>Terminal capacitance</td>
<td>$C_t$</td>
<td>$V_r=100$ V, $f=1$ MHz</td>
<td>-</td>
<td>10</td>
<td>-</td>
<td>pF</td>
</tr>
</tbody>
</table>

www.hamamatsu.com
Si PIN photodiode

**Spectral response**

![Spectral response graph](Typ. Ta=25 ℃)

**Response waveform**

![Response waveform graph](Typ. Ta=25 ℃, λ=1060 nm (YAG laser), V=100 V, R=50 Ω)

**Dark current vs. reverse voltage**

![Dark current graph](Typ. Ta=25 ℃)

**Terminal capacitance vs. reverse voltage**

![Terminal capacitance graph](Typ. Ta=25 ℃)

---

**Photo sensitivity (A/W)**

<table>
<thead>
<tr>
<th>Wavelength (nm)</th>
<th>200</th>
<th>400</th>
<th>600</th>
<th>800</th>
<th>1000</th>
<th>1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photo sensitivity</td>
<td>0.1</td>
<td>0.3</td>
<td>0.5</td>
<td>0.7</td>
<td>0.8</td>
<td></td>
</tr>
</tbody>
</table>

**Dark current**

- 10 nA
- 1 nA
- 100 pA
- 10 pA

**Reverse voltage (V)**

- 0.01
- 0.1
- 1
- 10
- 100

**Terminal capacitance**

- 1 nF
- 100 pF
- 10 pF
- 1 pF

**Reverse voltage (V)**

- 0.1
- 1
- 10
- 100
### Dimensional outline (unit: mm)

- **Active area:** \( \phi 5.0 \)
- **Photosensitive surface:** \( \phi 0.5 \) max.
- **Lead:** \( \phi 0.45 \)
- **Index mark:** \( \phi 1.4 \)
- **Case:** \( \phi 1.0 \) max.

**Chip position accuracy with respect to the cap center:** \( X, Y \leq 0.4 \)
Si PIN photodiode

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

- Precautions
  - Notice
  - Metal, ceramic, plastic packages / Precautions

- Technical information
  - Si photodiode / Application circuit examples

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The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use.

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