Si PIN photodiode
S1223 series

For visible to IR, precision photometry

Features
- High sensitivity
- High reliability
- High-speed response
  S1223: fc=30 MHz
  S1223-01: fc=20 MHz
- Low capacitance

Applications
- Optical measurement equipment
- Analytical equipment, etc.

General ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>S1223</th>
<th>S1223-01</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Window material</td>
<td>-</td>
<td>borosilicate glass</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Package</td>
<td>-</td>
<td>TO-5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Active area size</td>
<td>A</td>
<td>2.4 × 2.8</td>
<td>3.6 × 3.6</td>
<td>mm²</td>
</tr>
<tr>
<td>Effective active area</td>
<td>-</td>
<td>6.6</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

Absolute maximum ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>S1223</th>
<th>S1223-01</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse voltage</td>
<td>V R Max.</td>
<td>30</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>Power dissipation</td>
<td>P</td>
<td>100</td>
<td>-</td>
<td>mW</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Topr</td>
<td>-40 to +100</td>
<td>-</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>Tstg</td>
<td>-55 to +125</td>
<td>-</td>
<td>°C</td>
</tr>
</tbody>
</table>

Electrical and optical characteristics (Ta=25 °C)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Spectral response range</td>
<td>( \lambda )</td>
<td>320 to 1100</td>
<td>-</td>
<td>960</td>
<td>-</td>
<td>320 to 1100</td>
<td>-</td>
<td>nm</td>
<td></td>
</tr>
<tr>
<td>Peak sensitivity wavelength</td>
<td>( \lambda_p )</td>
<td>0.6</td>
<td>-</td>
<td>0.6</td>
<td>-</td>
<td>0.6</td>
<td>-</td>
<td>nm</td>
<td></td>
</tr>
<tr>
<td>Photo sensitivity</td>
<td>S</td>
<td>( \lambda=\lambda_p )</td>
<td>0.45</td>
<td>-</td>
<td>0.45</td>
<td>-</td>
<td>0.45</td>
<td>A/W</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>( \lambda=660 \text{ nm} )</td>
<td>0.52</td>
<td>-</td>
<td>0.52</td>
<td>-</td>
<td>0.52</td>
<td>A/W</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>( \lambda=780 \text{ nm} )</td>
<td>0.54</td>
<td>-</td>
<td>0.54</td>
<td>-</td>
<td>0.54</td>
<td>A/W</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>( \lambda=830 \text{ nm} )</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>A/W</td>
<td></td>
</tr>
<tr>
<td>Short circuit current</td>
<td>Isc</td>
<td>100 ( \lambda )</td>
<td>5</td>
<td>6.3</td>
<td>-</td>
<td>10</td>
<td>13</td>
<td>-</td>
<td>µA</td>
</tr>
<tr>
<td>Dark current</td>
<td>I D</td>
<td>V R=20 V</td>
<td>-</td>
<td>0.1</td>
<td>-</td>
<td>0.2</td>
<td>10</td>
<td>nA</td>
<td></td>
</tr>
<tr>
<td>Temp. coefficient of I D</td>
<td>T C D</td>
<td>V R=20 V</td>
<td>-</td>
<td>1.15</td>
<td>-</td>
<td>1.15</td>
<td>-</td>
<td>times/°C</td>
<td></td>
</tr>
<tr>
<td>Cut-off frequency</td>
<td>fc</td>
<td>V R=20 V, -3 dB</td>
<td>-</td>
<td>30</td>
<td>-</td>
<td>20</td>
<td>-</td>
<td>MHz</td>
<td></td>
</tr>
<tr>
<td>Terminal capacitance</td>
<td>C t</td>
<td>V R=20 V, f=1 MHz</td>
<td>-</td>
<td>10</td>
<td>-</td>
<td>20</td>
<td>-</td>
<td>pF</td>
<td></td>
</tr>
<tr>
<td>Noise equivalent power</td>
<td>NEP</td>
<td>V R=20 V, ( \lambda=\lambda_p )</td>
<td>9.4 × 10^{-15}</td>
<td>-</td>
<td>-</td>
<td>1.3 × 10^{-14}</td>
<td>-</td>
<td>W/Hz^{1/2}</td>
<td></td>
</tr>
</tbody>
</table>
Si PIN photodiode S1223 series

- **Spectral response**
  - WAVELENGTH (nm) vs PHOTO SENSITIVITY (A/W) (Typ. Ta=25 °C)

- **Photo sensitivity temperature characteristic**
  - WAVELENGTH (nm) vs TEMPERATURE COEFFICIENT (%) (Typ.)

- **Dark current vs. reverse voltage**
  - REVERSE VOLTAGE (V) vs DARK CURRENT (Typ. Ta=25 °C)

- **Terminal capacitance vs. reverse voltage**
  - REVERSE VOLTAGE (V) vs TERMINAL CAPACITANCE (Typ. Ta=25 °C, f=1 MHz)

- **Dimensional outline (unit: mm)**
  - LEAD, WINDOW, PHOTOSENSITIVE SURFACE, CONNECTED TO CASE
  - The glass window may extend a maximum of 0.2 mm above the upper surface of the cap.