Si PIN photodiode

S3204/S3584 series

Large active area Si PIN photodiodes

Features
- Sensitivity matching with BGO and CsI (TI) scintillators
- High quantum efficiency (Unsealed type): QE=85 % (λ=540 nm)
- Low capacitance
- High-speed response
- High stability
- Good energy resolution

Applications
- Scintillation detectors
- Hodoscopes
- TOF counters

Structure / Absolute maximum ratings

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Window material</th>
<th>Active area (mm)</th>
<th>Depletion layer thickness (mm)</th>
<th>Reverse voltage VR max (V)</th>
<th>Power dissipation P (mW)</th>
<th>Operating temperature Topr (°C)</th>
<th>Storage temperature Tstg (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S3204-08</td>
<td>Epoxy resin</td>
<td>18 × 18</td>
<td>0.3</td>
<td>100</td>
<td>100</td>
<td>-20 to +60</td>
<td>-20 to +80</td>
</tr>
<tr>
<td>S3204-09</td>
<td>Unsealed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3584-08</td>
<td>Epoxy resin</td>
<td>28 × 28</td>
<td>0.3</td>
<td>300</td>
<td>300</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>S3584-09</td>
<td>Unsealed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Absolute maximum ratings are the values that must not be exceeded at any time. If even one of the absolute maximum ratings is exceeded even for a moment, the product quality may be impaired. Always be sure to use the product within the absolute maximum ratings.

Electrical and optical characteristics (Typ. Ta=25 °C, unless otherwise noted)

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Spectral response range λ (nm)</th>
<th>Peak sensitivity wavelength λ_p (nm)</th>
<th>Photo sensitivity S (A/W)</th>
<th>Short circuit current Isc 100 lx (μA)</th>
<th>Dark current I_D VR=70 V (nA)</th>
<th>Temp. coefficient of I_D Tc0 (times/°C)</th>
<th>Cut-off Frequency fc VR=70 V -3 dB (MHz)</th>
<th>NEP VR=70 V (W/Hz^{1/2})</th>
</tr>
</thead>
<tbody>
<tr>
<td>S3204-08</td>
<td>340 to 1100</td>
<td>960</td>
<td>0.66</td>
<td>0.20 0.30 0.36 340</td>
<td>6 20</td>
<td>1.12</td>
<td>20</td>
<td>6.6 × 10^{−14}</td>
</tr>
<tr>
<td>S3204-09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td>300</td>
</tr>
<tr>
<td>S3584-08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td>8.6 × 10^{−14}</td>
</tr>
<tr>
<td>S3584-09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td>300</td>
</tr>
</tbody>
</table>

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**Spectral response**

![Spectral response graph](image1)

**Spectral response (without window)**

![Spectral response (without window) graph](image2)

**Photo sensitivity temperature characteristic**

![Photo sensitivity temperature characteristic graph](image3)

**Dark current vs. reverse voltage**

![Dark current vs. reverse voltage graph](image4)
**Terminal capacitance vs. reverse voltage**

(Typ. Ta=25 °C, f=1 MHz)

<table>
<thead>
<tr>
<th>Reverse voltage (V)</th>
<th>Terminal capacitance (pF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 nF</td>
<td>10 pF, 0.1, 1, 10, 100</td>
</tr>
<tr>
<td>1 nF</td>
<td>100 pF</td>
</tr>
<tr>
<td>100 pF</td>
<td>1 nF</td>
</tr>
<tr>
<td>10 pF</td>
<td>10 nF (Typ. Ta=25 °C, f=1 MHz)</td>
</tr>
</tbody>
</table>

**Dimensional outline (unit: mm)**

**S3204-08**

- Active area: 18 × 18
- Lead: 1.2 ± 0.2
- Photogeneric surface: 0.45
- Resin: 3.4
- White ceramic: 25.5

**S3204-09**

- Active area: 18 × 18
- Lead: 1.2 ± 0.2
- Photogeneric surface: 0.45
- Resin: 3.4
- White ceramic: 25.5
Si PIN photodiode

S3204/S3584 series

S3584-08

Active area
28 × 28

Resin

White ceramic

Lead

∅ 0.45

S3584-09

Active area
28 × 28

Resin

White ceramic

Lead

∅ 0.45

Information described in this material is current as of January, 2012.

Product specifications are subject to change without prior notice due to improvements or other reasons. Before assembly into final products, please contact us for the delivery specification sheet to check the latest information.

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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