Si photodiodes

The S1087/S1133 series are ceramic package photodiodes that offer low dark current. Ceramic package used is light-impervious, so no stray light can reach the photosensitive area from the side or backside. This allows reliable optical measurements in the visible to near infrared range, over a wide dynamic range from low light levels to high light levels.

### Features

- **S1087, S1133**: For visible range
- **S1087-01, S1133-01**: For visible to IR range
- **S1133-14**: For visible to near IR range

### Applications

- Exposure meters
- Illuminometers
- Copiers
- Display light control
- Optical switches

### Structure /Absolute maximum ratings

<table>
<thead>
<tr>
<th>Type no.</th>
<th>Dimensional outline/ Window material*1</th>
<th>Photosensitive area size</th>
<th>Absolute maximum ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(mm)</td>
<td>Reverse voltage Vr max</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Operating temperature Tôpr</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Storage temperature Tstg</td>
</tr>
<tr>
<td>S1087</td>
<td>(1)/V</td>
<td>1.3 × 1.3</td>
<td>10</td>
</tr>
<tr>
<td>S1087-01</td>
<td>(2)/R</td>
<td>2.4 × 2.8</td>
<td></td>
</tr>
<tr>
<td>S1133</td>
<td>(3)/V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1133-01</td>
<td>(4)/R</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1133-14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1: Window material R=resin coating, V=visual-compensation filter
*2: No condensation

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 (Typ. Ta=25 °C, unless otherwise noted)

<table>
<thead>
<tr>
<th>Type no.</th>
<th>Spectral response range λp (nm)</th>
<th>Peak sensitivity wavelength λp (nm)</th>
<th>Photosensitivity S (A/W)</th>
<th>Infrared sensitivity rate (%)</th>
<th>Short circuit current Isc 100/μA (μA)</th>
<th>Temp. coefficient of Isc (%/°C)</th>
<th>Dark current To = 1 V max. (pA)</th>
<th>Temp. coefficient of TCID (times/°C)</th>
<th>Rise time tr (μs)</th>
<th>Min. resistance Rsh (μΩ)</th>
<th>Typ. resistance Rsh (μΩ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1087</td>
<td>320 to 730</td>
<td>560</td>
<td>0.3</td>
<td>0.3</td>
<td>0.19</td>
<td>0.16</td>
<td>-0.01</td>
<td>10</td>
<td>1.12</td>
<td>0.5</td>
<td>200</td>
</tr>
<tr>
<td>S1087-01</td>
<td>320 to 1100</td>
<td>960</td>
<td>0.38</td>
<td>0.38</td>
<td>0.38</td>
<td>1.3</td>
<td>0.1</td>
<td>5.4</td>
<td>2.5</td>
<td>0.5</td>
<td>700</td>
</tr>
<tr>
<td>S1133</td>
<td>320 to 730</td>
<td>560</td>
<td>0.3</td>
<td>0.3</td>
<td>0.19</td>
<td>0.61</td>
<td>-0.01</td>
<td>5.4</td>
<td>2.5</td>
<td>0.5</td>
<td>700</td>
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<td>0.38</td>
<td>5.4</td>
<td>0.1</td>
<td>3.1</td>
<td>20</td>
<td>0.5</td>
<td>200</td>
</tr>
<tr>
<td>S1133-14</td>
<td>320 to 1000</td>
<td>720</td>
<td>0.4</td>
<td>0.37</td>
<td>0.37</td>
<td>3.1</td>
<td>0.1</td>
<td>20</td>
<td>0.5</td>
<td>0.5</td>
<td>200</td>
</tr>
</tbody>
</table>
Si photodiodes  |  S1087/S1133 series

- **Spectral response**

- **Photosensitivity temperature characteristics (S1087)**

- **Rise time vs. load resistance**

- **Dark current vs. reverse voltage**

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**S1087/S1133 series**

**Spectral response**

![Spectral response graph](image1)

**Photosensitivity temperature characteristics (S1087)**

![Temperature coefficient graph](image2)

**Rise time vs. load resistance**

![Rise time graph](image3)

**Dark current vs. reverse voltage**

![Dark current graph](image4)
Si photodiodes | S1087/S1133 series

Shunt resistance temperature characteristics

- Ambient temperature (°C)
- Shunt resistance
- Short circuit current linearity

- Incident light level (lx)
- Short circuit current (A)

Directivity

- S1087, S1133
- S1087-01, S1133-01/-14

Relative sensitivity (%)
Si photodiodes | S1087/S1133 series

- Dimensional outlines (unit: mm)

(1) S1087

(2) S1087-01

(3) S1133

(4) S1133-01/-14

<table>
<thead>
<tr>
<th>S1133-01</th>
<th>S1133-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Tolerance unless otherwise noted: ±0.15

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