Si photodiodes

S12698 series

High UV resistance, photodiodes for UV monitor

The S12698 series are Si photodiodes that have achieved high reliability for monitoring ultraviolet light by employing a structure that does not use resin. They exhibit low sensitivity deterioration under UV light irradiation and are suitable for applications such as monitoring intense UV light sources.

Features

- With UV glass window (hermetically sealed)
- High sensitivity in UV region
- High reliability for monitoring UV light irradiation
- Resin material not used

Applications

- Power monitor for UV light sources
- Analytical instrument
- Optical measurement equipment

Structure / Absolute maximum ratings

<table>
<thead>
<tr>
<th>Type no.</th>
<th>Window material</th>
<th>Package</th>
<th>Photosensitive area size (mm)</th>
<th>Effective photosensitive area (mm²)</th>
<th>Absolute maximum ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reverse voltage VR max (V)</td>
</tr>
<tr>
<td>S12698</td>
<td>UV glass</td>
<td>TO-18</td>
<td>1.1 × 1.1</td>
<td>1.2</td>
<td>5</td>
</tr>
<tr>
<td>S12698-01</td>
<td>UV glass</td>
<td>TO-5</td>
<td>2.4 × 2.4</td>
<td>5.8</td>
<td>5</td>
</tr>
<tr>
<td>S12698-02</td>
<td>UV glass</td>
<td>TO-8</td>
<td>5.8 × 5.8</td>
<td>33.6</td>
<td>5</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 (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 λp (nm)</th>
<th>Photosensitivity S (A/W)</th>
<th>Short circuit current Isc (100 lx) Min. (μA)</th>
<th>Typ. (μA)</th>
<th>Dark current Id (VR=10 mV) max. (pA)</th>
<th>Temp. coefficient of Io (T°C) (times/°C)</th>
<th>Rise time tr (VR=0 V) Vr=1 kΩ Rl=1 kΩ λ=655 nm (μs)</th>
<th>Terminal capacitance Ct (VR=0 V) f=10 kHz (pF)</th>
<th>Shunt resistance Rsh max. (GO)</th>
<th>Noise equivalent power NEP (W/Hz1/2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S12698</td>
<td>190 to 1000</td>
<td>800</td>
<td>0.38</td>
<td>0.6</td>
<td>0.8</td>
<td>10</td>
<td>1.12</td>
<td>0.1</td>
<td>5.0</td>
<td>1.5</td>
<td>0.8</td>
</tr>
<tr>
<td>S12698-01</td>
<td></td>
<td></td>
<td></td>
<td>1.7</td>
<td>2.5</td>
<td>30</td>
<td></td>
<td>0.5</td>
<td>230</td>
<td>0.3</td>
<td>2.0</td>
</tr>
<tr>
<td>S12698-02</td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td>18</td>
<td>100</td>
<td></td>
<td>1.5</td>
<td>700</td>
<td>0.1</td>
<td>3.5</td>
</tr>
</tbody>
</table>
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**Spectral response**

(Typ. Ta=25 °C)

![Spectral response graph](image)

**Photosensitivity temperature characteristics**

(Typ.)

![Temperature coefficient graph](image)

**Changes in spectral response after irradiated with UV light**

(Typ. Ta=25 °C, O2 lamp: 30 W, irradiation distance: approx. 70 mm, irradiation time: 1000 h)

![Changes in spectral response graph](image)

**Directivity**

(Typ. Ta=25 °C, light source: tungsten lamp)

![Directivity graph](image)
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### Dark current vs. reverse voltage

![Graph showing dark current vs. reverse voltage](KSPDB0352EA)

**Terminal capacitance vs. reverse voltage**

![Graph showing terminal capacitance vs. reverse voltage](KSPDB0353EA)

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#### Dimensional outlines (unit: mm)

**S12698**

- Photosensitive area: $1.1 \times 1.1$
- UV glass:
- Photosensitive surface:
- Lead:
- Connected to case:
- Tolerance unless otherwise noted: ±0.2
  - Distance from photosensitive area center to cap center:
    - $0.5 \text{mm} \leq x \leq 0.5$
  - Other dimensions:

**S12698-01**

- Photosensitive area: $2.4 \times 2.4$
- UV glass:
- Photosensitive surface:
- Lead:
- Connected to case:
- Tolerance unless otherwise noted: ±0.2
  - Distance from photosensitive area center to cap center:
    - $0.5 \text{mm} \leq x \leq 0.5$
  - Other dimensions:

The UV glass window may extend a maximum of 0.2 mm beyond the upper surface of the cap.
Precautions against UV light exposure

- When UV light irradiation is applied, the product characteristics may degrade. Such examples include degradation of the product's UV sensitivity and increase in dark current. This phenomenon varies depending on the irradiation level, irradiation intensity, usage time, and ambient environment and also varies depending on the product model. Before employing the product, we recommend that you check the tolerance under the ultraviolet light environment that the product will be used in.
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Related information
www.hamamatsu.com/sp/ssp/doc_en.html
- Precautions
  - Disclaimer
  - Metal, ceramic, plastic package products

Technical information
- Si photodiode / Application circuit example

Information described in this material is current as of November, 2015.
Product specifications are subject to change without prior notice due to improvements or other reasons. This document has been carefully prepared and the information contained is believed to be accurate. In rare cases, however, there may be inaccuracies such as text errors. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.
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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