The S9674 is a photodiode that is applicable to lead-free solder reflow and has an extremely wide operating and storage temperature range (-40 to +125 °C). The small and thin leadless package allows reducing the mount area on a printed circuit board.

### Features
- Suitable for lead-free solder reflow
- Surface mount type, small and thin leadless package
- Operating/storage temperature: -40 to +125 °C
- Photosensitive area: 2 × 2 mm
- High sensitivity: 0.7 A/W (λ=960 nm)

### Absolute maximum ratings

<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>Reverse voltage</td>
<td>Vr max.</td>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Topr</td>
<td></td>
<td>-40</td>
<td>+125</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>Tstg</td>
<td></td>
<td>-40</td>
<td>+125</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>Reflow soldering condition*1</td>
<td>Tsol</td>
<td>Peak temperature 260 °C, two times (see page 5)</td>
<td>-</td>
<td></td>
<td></td>
<td>-</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.

*1: JEDEC level 4

### Electrical and optical characteristics (Ta=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>λ</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
<td>nm</td>
</tr>
<tr>
<td>Peak sensitivity wavelength</td>
<td>λ_p</td>
<td></td>
<td>320</td>
<td>1100</td>
<td></td>
<td>nm</td>
</tr>
<tr>
<td>Photo sensitivity</td>
<td>S</td>
<td>λ=λ_p</td>
<td>0.6</td>
<td>0.7</td>
<td></td>
<td>A/W</td>
</tr>
<tr>
<td>Short circuit current</td>
<td>Isc</td>
<td>100 λ_v, 2856 K</td>
<td>-</td>
<td>4.8</td>
<td></td>
<td>μA</td>
</tr>
<tr>
<td>Temperature coefficient of Isc</td>
<td></td>
<td>-</td>
<td>-</td>
<td>+0.1</td>
<td></td>
<td>%/°C</td>
</tr>
<tr>
<td>Half-value angle</td>
<td></td>
<td>±60</td>
<td>-</td>
<td></td>
<td></td>
<td>degree</td>
</tr>
<tr>
<td>Dark current</td>
<td>Id</td>
<td>Vr=5 V</td>
<td>-</td>
<td>0.01</td>
<td>1</td>
<td>nA</td>
</tr>
<tr>
<td>Temperature coefficient of Id</td>
<td>T_Id</td>
<td></td>
<td>-</td>
<td>1.12</td>
<td></td>
<td>times/°C</td>
</tr>
<tr>
<td>Rise time</td>
<td>tr</td>
<td>Vr=0 V, R_L=1 kΩ, 10 to 90%</td>
<td>-</td>
<td>2</td>
<td></td>
<td>μs</td>
</tr>
<tr>
<td>Terminal capacitance</td>
<td>Ct</td>
<td>Vr=0 V, f=10 kHz</td>
<td>-</td>
<td>500</td>
<td></td>
<td>pF</td>
</tr>
</tbody>
</table>
Si photodiode  
S9674

- **Spectral response**

  ![Spectral response graph](image)
  
  - **Photoresponsivity** vs. **Wavelength (nm)**
    - **QE=100%**

- **Photosensitivity temperature characteristics**

  ![Photosensitivity temperature graph](image)
  
  - **Temperature coefficient (%)** vs. **Wavelength (nm)**

- **Linearity**

  ![Linearity graph](image)
  
  - **Short circuit current** vs. **Illuminance (lx)**

- **Dark current vs. reverse voltage**

  ![Dark current vs. reverse voltage graph](image)
  
  - **Dark current** vs. **Reverse voltage (V)**
Si photodiode

**Terminal capacitance vs. reverse voltage**

(Typ. Ta=25 °C)

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

**Directivity**

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

![Graph showing directivity.](image)

**Dimensional outline (unit: mm)**

Photosensitive area:

- (2 × 2)
- 5.7
- 4.6
- (4.1)
- 3.1
- 2.5

Cathode index:

- 1.05
- 3.3
- 1.05 (2 ×) R0.3

Photosensitive surface:

- 1.4 ± 0.2
- 0.85
- (0.55)

Recommended land pattern:

- (6.5)
- (3.2)
- (2.8)

Tolerance unless otherwise noted: ±0.15, ±2°
Si photodiode  S9674

**Standard packing specifications**

- Reel (conforms to JEITA ET-7200)

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Hub diameter</th>
<th>Tape width</th>
<th>Material</th>
<th>Electrostatic characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>254 mm</td>
<td>100 mm</td>
<td>12 mm</td>
<td>Polystyrene</td>
<td>Conductive</td>
</tr>
</tbody>
</table>

- Embossed tape (unit: mm, material: polystyrene, conductive)

- Packing quantity
  2000 pcs/reel

- Packing type
  Reel and desiccant in moisture-proof packaging (vacuum-sealed)
Measured example of temperature profile with our hot-air reflow oven for product testing

- This product supports lead-free soldering. After unpacking, store it in an environment at a temperature of 30 °C or less and a humidity of 60% or less, and perform soldering within 72 hours.
- The effect that the product receives during reflow soldering varies depending on the circuit board and reflow oven that are used. Before actual reflow soldering, check for any problems by testing out the reflow soldering methods in advance.

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

- Precautions
- Disclaimer
- Surface mount type products
- Technical information
- Si photodiode / Application circuit examples

Information described in this material is current as of July, 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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