These are short wavelength APDs with improved sensitivity in the UV to visible range. They offer high gain, high sensitivity, and low noise in the short wavelength range. They are suitable for applications such as low-light-level measurement and analytical instrument.

### Features
- High sensitivity and low noise in UV to visible range

### Applications
- Low-light-level measurement
- Analytical instrument

### Structure / Absolute maximum ratings

<table>
<thead>
<tr>
<th>Type no.</th>
<th>Dimensional outline/Window material(^1)</th>
<th>Package</th>
<th>Effective photosensitive(^2) area size (mm)</th>
<th>Absolute maximum ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Operating temperature Topr (°C)</td>
</tr>
<tr>
<td>S12053-02</td>
<td>(1)/U</td>
<td>TO-18</td>
<td>a0.2</td>
<td>-20 to +60</td>
</tr>
<tr>
<td>S12053-05</td>
<td></td>
<td></td>
<td>a0.5</td>
<td></td>
</tr>
<tr>
<td>S12053-10</td>
<td></td>
<td></td>
<td>a1.0</td>
<td></td>
</tr>
<tr>
<td>S9075</td>
<td>(2)/U</td>
<td>TO-5</td>
<td>a1.5</td>
<td></td>
</tr>
<tr>
<td>S5344</td>
<td>(3)/U</td>
<td>TO-8</td>
<td>a3.0</td>
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</tr>
<tr>
<td>S5345</td>
<td></td>
<td></td>
<td>a5.0</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.

\(^{1}\): U=UV glass

\(^{2}\): Area in which a typical gain can be obtained

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

<table>
<thead>
<tr>
<th>Type no.</th>
<th>Spectral response range (\lambda) (nm)</th>
<th>Peak(^3) sensitivity (\lambda_p) (nm)</th>
<th>Photo-sensitivity (S) (M=1) (\lambda=620) nm (A/W)</th>
<th>Quantum efficiency (QE) (M=1) (\lambda=620) nm (%)</th>
<th>Breakdown voltage (V_{BR}) (Id=100) μA</th>
<th>Temp. coefficient of (V_{BR}) (V/°C)</th>
<th>Dark(^3) current Id (Typ.) (nA)</th>
<th>Max. (nA)</th>
<th>Cutoff(^3) frequency (Fc) (RL=50) Ω (MHz)</th>
<th>Terminal(^3) capacitance Ct (pF)</th>
<th>Excess(^3) noise figure (x) (\lambda=650) nm</th>
<th>Gain M (\lambda=650) nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>S12053-02</td>
<td>200 to 1000</td>
<td>620</td>
<td>0.42</td>
<td>80</td>
<td>150</td>
<td>200</td>
<td>0.14</td>
<td>5</td>
<td>900</td>
<td>2</td>
<td>0.28</td>
<td>50</td>
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<td></td>
<td></td>
<td>400</td>
<td>5</td>
<td>100</td>
<td>30</td>
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<td>S12053-10</td>
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<td></td>
<td></td>
<td></td>
<td>250</td>
<td>15</td>
<td>100</td>
<td>120</td>
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<td>S9075</td>
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<td>5</td>
<td>15</td>
<td>100</td>
<td>30</td>
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<td></td>
<td>3</td>
<td>8</td>
<td>100</td>
<td>320</td>
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<tr>
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</tbody>
</table>

\(^{3}\): Values measured at a gain listed in the characteristics table
**Spectral response**

![Graph showing spectral response](image)

**Quantum efficiency vs. wavelength**

![Graph showing quantum efficiency vs. wavelength](image)

**Dark current vs. reverse voltage**

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

**Gain vs. reverse voltage**

![Graph showing gain vs. reverse voltage](image)
**Terminal capacitance vs. reverse voltage**

(Typ. Ta=25 °C, f=1 MHz)

![Terminal capacitance vs. reverse voltage graph](image)

**Excess noise factor vs. gain**

(Typ. Ta=25 °C, f=10 kHz, B=1 Hz)

![Excess noise factor vs. gain graph](image)

**Dimensional outlines (unit: mm)**

1. **S12053-02/-05/-10**
   - Distance from photosensitive area center to cap center:
     - \(-0.2 \leq X \leq 0.2\)
     - \(-0.2 \leq Y \leq 0.2\)
   - The glass window may extend a maximum of 0.1 mm above the upper surface of the cap.

2. **S9075, S5344**
   - Distance from photosensitive area center to cap center:
     - \(-0.3 \leq X \leq 0.3\)
     - \(-0.3 \leq Y \leq 0.3\)
   - The glass window may extend a maximum of 0.2 mm above the upper surface of the cap.
**Precautions**

Long-term exposure to UV will cause product characteristics to deteriorate. Avoid exposing the products to any unnecessary UV irradiation.

**Related information**


- Precautions
  - Notice
  - Metal, ceramic, plastic package products / Precautions

- Technical information
  - Si APD / Technical information
Si APD  |  S12053-02/-05/-10, S9075, S5344, S5345

Information described in this material is current as of October, 2013. 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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