S8551, S8552 and S8553 are VUV (Vacuum UV) photodiodes suitable for detection of ArF excimer lasers ($\lambda=193$ nm). Designed to provide optimal performance in the VUV range, these photodiodes offer more stable sensitivity even after long exposure to VUV radiation compared with conventional types.

### Features
- Reliable detection improves of ArF excimer laser ($\lambda=193$ nm)
- Large active area
  - S8551: $5.8 \times 5.8$ mm
  - S8552: $10 \times 10$ mm
  - S8553: $18 \times 18$ mm
- Windowless package
  - S8551: TO-8 metal package
  - S8552: $16.5 \times 15.0$ mm ceramic package
  - S8553: $25.5 \times 25.5$ mm ceramic package

### Applications
- ArF excimer laser detection
- Detection of various UV light sources

### Absolute maximum ratings ($Ta=25$ °C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse voltage</td>
<td>VR Max.</td>
<td>5</td>
<td>V</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Topr</td>
<td>-20 to $+60$ °C</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>Tstg</td>
<td>-55 to $+80$ °C</td>
<td></td>
</tr>
</tbody>
</table>

* No condensation

### Electrical and optical characteristics ($Ta=25$ °C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Condition</th>
<th>S8551</th>
<th>S8552</th>
<th>S8553</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photo sensitivity</td>
<td>S</td>
<td>$\lambda=193$ nm</td>
<td>45</td>
<td>60</td>
<td>-</td>
<td>mA/W</td>
</tr>
<tr>
<td>Dark current</td>
<td>I0</td>
<td>$VR=10$ mV</td>
<td>-</td>
<td>0.02</td>
<td>0.5</td>
<td>nA</td>
</tr>
<tr>
<td>Terminal capacitance</td>
<td>Ct</td>
<td>$VR=0$ V, $f=10$ kHz</td>
<td>1.0</td>
<td>-</td>
<td>4.0</td>
<td>nF</td>
</tr>
<tr>
<td>Rise time</td>
<td>tr</td>
<td>$VR=0$ V, $RL=1$ kΩ, 10 to 90 %</td>
<td>-</td>
<td>2</td>
<td>9</td>
<td>µs</td>
</tr>
</tbody>
</table>

S8551, S8552 and S8553 use windowless packages with no protection on the photodiode chip. Always use the following precautions when handling these photodiodes.

#### Handling precautions
- Handle the photodiodes in a clean room.
- Never touch the photodiode chip surface and wire bonding.
- Wear dust-proof gloves and dust-proof mask.
- Use an air dust cleaner to blow away dust and foreign matter on the photodiode chip surface.
- Do not clean the photodiodes by any method other than air blow.
### Relative Sensitivity (%)

<table>
<thead>
<tr>
<th>Number of Shot</th>
<th>5 × 10^6</th>
<th>1 × 10^7</th>
</tr>
</thead>
<tbody>
<tr>
<td>S8551, S8552, S8553</td>
<td>40</td>
<td>60</td>
</tr>
</tbody>
</table>

**CONVENTIONAL TYPE**

- **Typ. ArF excimer laser, 0.1 mJ/cm²/pulse, f=100 Hz, λ=193 nm, pulse width=15 ns (FWHM)**

### Dimensional Outlines (unit: mm)

#### S8551
- **Active Area**: 5.8 × 5.8
- **Cap Without Window**: 0.45
- **Anode Terminal Mark**: 1.4
- **Case**: 1.0 MAX.

#### S8552
- **Active Area**: 10 × 10
- **PhotoSensitive Surface**: 16.5 ± 0.2
- **Anode Terminal Mark**: 0.5
- **Lead**: 12.35 ± 0.1

#### S8553
- **Active Area**: 18 × 18
- **PhotoSensitive Surface**: 25.5
- **Lead**: 13.7 ± 0.3