Si PIN photodiode
S9055 series

Flat response characteristics up to high frequency bands

S9055 series Si PIN photodiodes deliver a high-speed response exceeding 1 GHz at low bias voltage (VR=2 V). Their low capacitance (less than 1 pF) makes them ideal for combination with high-speed trans-impedance amplifiers.

**Features**
- Flat response characteristics up to high frequency bands
  - Frequency flatness: -0.5 dB Max.
  - (VR=2 V, λ=830 nm, f=100 MHz)
- High-speed response
  - S9055: 1.5 GHz (VR=2 V, -3 dB)
  - S9055-01: 2 GHz (VR=2 V, -3 dB)
- Low capacitance
  - S9055: 0.8 pF (VR=2 V)
  - S9055-01: 0.5 pF (VR=2 V)
- Highly reliable package: 3-pin TO-18 package

**Applications**
- Optical fiber communications
- High-speed measurement system
- Optical inter-connection

### General rating / absolute maximum ratings (Ta=25 °C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>S9055</th>
<th>S9055-01</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active area</td>
<td></td>
<td>φ0.2</td>
<td>φ0.1</td>
<td>mm</td>
</tr>
<tr>
<td>Reverse voltage</td>
<td>VR Max.</td>
<td>20</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Topr</td>
<td>-40 to +100</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>Tstg</td>
<td>-55 to +125</td>
<td></td>
<td>°C</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
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<th></th>
<th></th>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Spectral response range</td>
<td>λ</td>
<td></td>
<td></td>
<td>320</td>
<td>1000</td>
<td>320</td>
<td>1000</td>
<td></td>
<td></td>
<td>nm</td>
</tr>
<tr>
<td>Peak sensitivity wavelength</td>
<td>λp</td>
<td></td>
<td></td>
<td>0.2</td>
<td>0.25</td>
<td>-</td>
<td>-</td>
<td>0.2</td>
<td>0.25</td>
<td>nm</td>
</tr>
<tr>
<td>Photo sensitivity</td>
<td>S</td>
<td>λ=850 nm</td>
<td></td>
<td>0.2</td>
<td>0.25</td>
<td>-</td>
<td>-</td>
<td>0.2</td>
<td>0.25</td>
<td>A/W</td>
</tr>
<tr>
<td>Dark current</td>
<td>I0</td>
<td>VR=2 V</td>
<td></td>
<td>-</td>
<td>1</td>
<td>100</td>
<td>-</td>
<td>1</td>
<td>100</td>
<td>pA</td>
</tr>
<tr>
<td>Terminal capacitance</td>
<td>Ct</td>
<td>VR=2 V, f=1 MHz</td>
<td>-</td>
<td>0.8</td>
<td>1</td>
<td>100</td>
<td>-</td>
<td>1</td>
<td>100</td>
<td>pF</td>
</tr>
<tr>
<td>Cut-off frequency</td>
<td>fc</td>
<td>VR=2 V, RL=25 Ω, -3dB</td>
<td>1.0</td>
<td>1.5</td>
<td>-</td>
<td>1.5</td>
<td>2</td>
<td>-</td>
<td></td>
<td>GHz</td>
</tr>
<tr>
<td>Frequency flatness</td>
<td></td>
<td>VR=2 V, λ=850 nm, f=100 MHz</td>
<td>-</td>
<td>-</td>
<td>-0.5</td>
<td>-</td>
<td>-</td>
<td>-0.5</td>
<td>dB</td>
<td></td>
</tr>
</tbody>
</table>
Si PIN photodiode S9055 series

- **Spectral response**
- **Dark current vs. reverse voltage**
- **Terminal capacitance vs. reverse voltage**

**Frequency characteristics**

- λ=410 nm
- λ=830 nm

**Dimensional outline (unit: mm)**

- The glass window does not extend beyond the upper edge of cap but may be recessed a maximum of 0.1 mm from the cap edge.

**Specifications**

- **WAVELENGTH (nm)**
  - 200
  - 400
  - 600
  - 800
  - 1000
  - 1200

- **PHOTO SENSITIVITY (A/W)**
  - 0
  - 0.1
  - 0.2
  - 0.3
  - 0.4

- **FREQUENCY**
  - 100 kHz
  - 1 MHz
  - 10 MHz
  - 100 MHz
  - 1 GHz
  - 10 GHz

- **RELATIVE OUTPUT (dB)**
  - -15
  - -10
  - -5
  - 0
  - 5

- **REVERSE VOLTAGE (V)**
  - 0.1
  - 1
  - 10
  - 100

- **TERMINAL CAPACITANCE**
  - 10 pF
  - 1 pF

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