# 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 ($V_R$=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.
  ($V_R$=2 V, λ=830 nm, f=100 MHz)
- High-speed response
  S9055: 1.5 GHz ($V_R$=2 V, -3 dB)
  S9055-01: 2 GHz ($V_R$=2 V, -3 dB)
- Low capacitance
  S9055: 0.8 pF ($V_R$=2 V)
  S9055-01: 0.5 pF ($V_R$=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)

| Parameter | Symbol | S9055 | S9055-01 | Unit |
|---|---|---|---|---|
| Active area | - | φ0.2 | φ0.1 | mm |
| Reverse voltage | $V_R$ Max. | 20 | | V |
| Operating temperature | Topr | -40 to +100 | | °C |
| Storage temperature | Tstg | -55 to +125 | | °C |

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

| Parameter | Symbol | Condition | S9055 | | | S9055-01 | | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | Min. | Typ. | Max. | |
| Spectral response range | λ | | 320 to 1000 | | | 320 to 1000 | | | nm |
| Peak sensitivity wavelength | λp | | - | 700 | - | - | 700 | - | nm |
| Photo sensitivity | S | λ=850 nm | 0.2 | 0.25 | - | 0.2 | 0.25 | - | A/W |
| Dark current | $I_D$ | $V_R$=2 V | - | 1 | 100 | - | 1 | 100 | pA |
| Terminal capacitance | Ct | $V_R$=2 V, f=1 MHz | - | 0.8 | 1.2 | - | 0.5 | 0.75 | pF |
| Cut-off frequency | fc | $V_R$=2 V, $R_L$=25 Ω -3dB | 1.0 | 1.5 | - | 1.5 | 2 | - | GHz |
| Frequency flatness | - | $V_R$=2 V, λ=850 nm f=100 MHz | - | - | -0.5 | - | - | -0.5 | dB |

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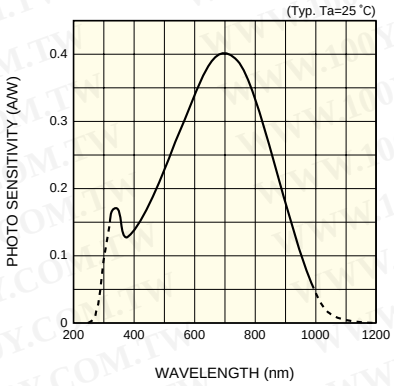
## ■ Spectral response

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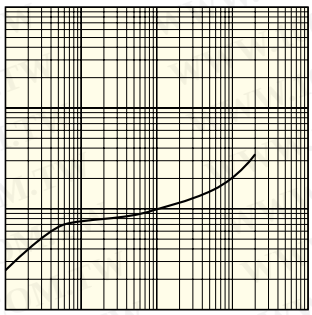
## ■ Dark current vs. reverse voltage



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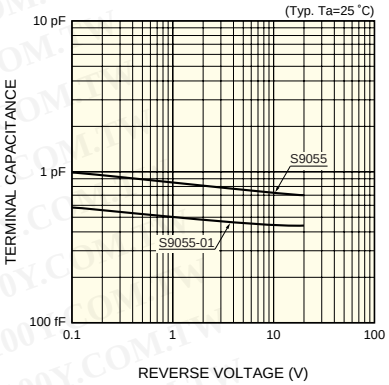
## ■ Terminal capacitance vs. reverse voltage

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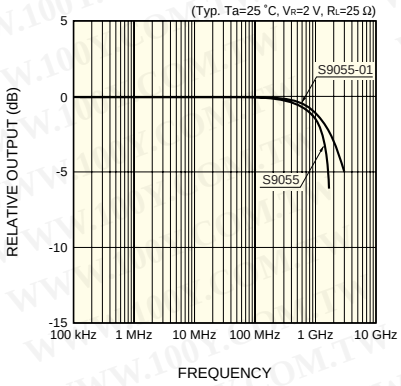
## ■ Frequency characteristics

λ=410 nm

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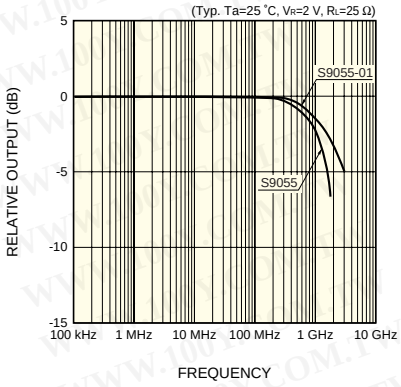
λ=830 nm

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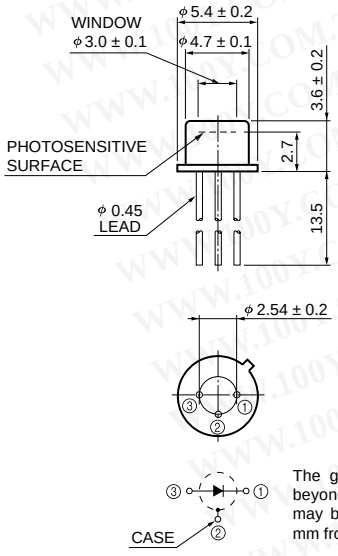
## ■ Dimensional outline (unit: mm)




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.

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