

Description

The SCA-005OP is a high sensitive silicon PIN photodiode for use in low light applications across the spectral range of 320nm to 1100 nm.

This N-type photodiode offers high speed, low capacitance, and high breakdown voltage characteristics.

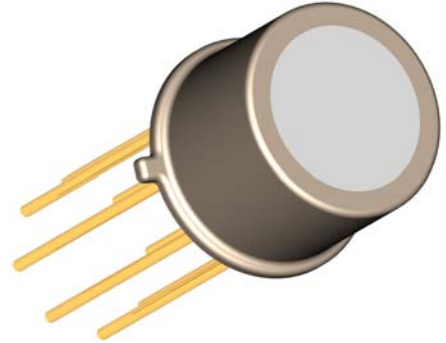
The standard version of model SCA-005OP is housed in a hermetically sealed electrically isolated 8 pin TO-39 metal case. It is also available in custom packages and in chip form for hybrid circuit boards.

This device is capable of meeting MIL-PRF-19500 requirements for environmental integrity and reliability.

Please contact Semicoa for special configurations
www.SEMICOA.com or (714) 979-1900

Applications

- Medical Analytical Instruments
- Optical Power Meters
- Densitometers
- Optical Smoke Detection
- Optical Spectroscopy



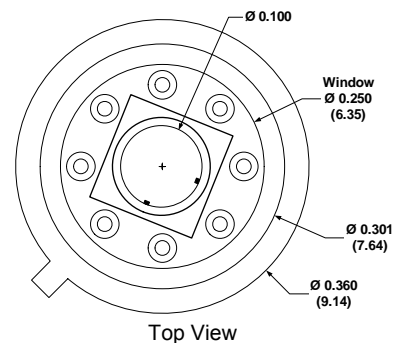
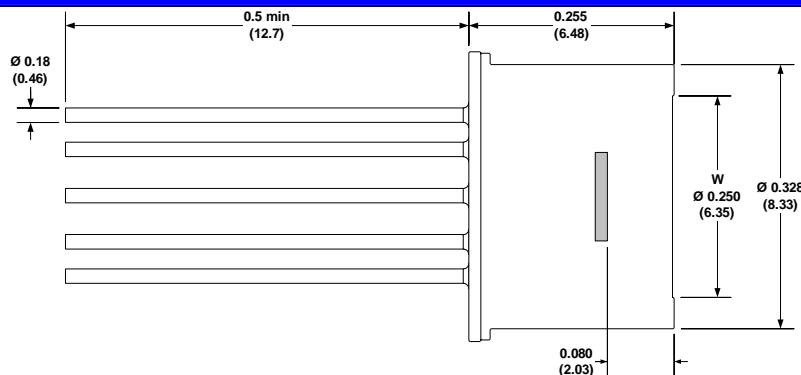
Features

- Photoconductive or Photovoltaic Regime
- Wide Bandwidth
- Available in Chip Form
- Spectral Response from 320 to 1100nm

Benefits

- Low Noise
- Compact Packaging
- High Sensitivity
- Gain Control

Package Outline



DEVICE CHARACTERISTICS

characteristics specified at $T_A = 25^\circ\text{C}$

Mechanical Characteristics

| | | | |
|-----------------|---|------|-----------------|
| Active Diameter | d | 0.10 | Inches |
| Active Area | A | 5.1 | mm ² |

Optical Characteristics

| | | | |
|---------------------------|-------------|-------------|----|
| Spectral Response | λ | 320 to 1100 | nm |
| Peak Sensitive Wavelength | λ_p | 950 | nm |

Electrical Characteristics

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|---------------------------|----------|---|---------------------|----------------------|-----------|-----------------------|
| Dark Current | I_D | $V_R = 1\text{ mV}$ $V_R = 25\text{ V}$ | | 0.002 0.5 | 2.0 50 | nA |
| Responsivity | R | $\lambda = 900\text{ nm}$ $\lambda = 830\text{ nm}$ $\lambda = 632\text{ nm}$ | 0.5 0.45 0.25 | 0.62 0.57 0.35 | | A/W |
| Risetime | t_r | $V_R = 25\text{ V}, R_L = 50\ \Omega$ | | 10 | 20 | ns |
| Capacitance | C_j | $V_R = 25\text{ V}, f = 1\text{ MHz}$ | | 10 | 15 | pF |
| Reverse Breakdown Voltage | V_{BR} | $I_R = 10\ \mu\text{A}$ | 50 | 100 | | V |
| Forward Voltage | V_F | $I_F = 1\text{ mA}$ | | 0.5 | 1.0 | V |
| Shunt Resistance | R_{sh} | $V_R = 1\text{ mV}$ | 10 | 200 | | M Ω |
| Series Resistance | R_S | $I_F = 10\text{ mA}$ | | 7.0 | 15.0 | Ω |
| Noise Equivalent Power | NEP | | | 2×10^{-14} | | W/ $\sqrt{\text{Hz}}$ |

Amplifier Specifications

| Parameter | Symbol | Min | Typ | Max | Units |
|--------------------------------|------------|---------|----------|----------|------------------------------|
| Supply Voltage | V_{SU} | ± 5 | ± 15 | ± 18 | V |
| Input Offset Voltage | V_{OS} | | 0.5 | 3 | mV |
| Supply Current | I_{SU} | | 2.8 | 5 | mA |
| Input Offset Drift (unnullled) | TCV_{OS} | | 4 | 15 | $\mu\text{V}/^\circ\text{C}$ |
| Input Bias Current | I_P | | 15 | | pA |
| Slew Rate | SR | 5 | 9 | | V/ μs |
| Gain Bandwidth Product | GBP | 3 | 5.4 | | MHz |
| Input Noise Voltage | e_N | | 20 | | nV/ $\sqrt{\text{Hz}}$ |

CHARACTERISTIC CURVES

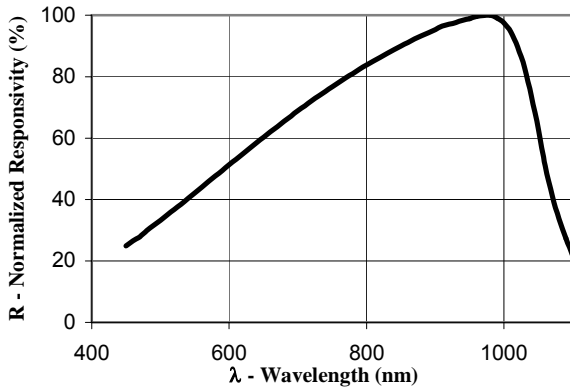


Figure 1 Responsivity vs Wavelength

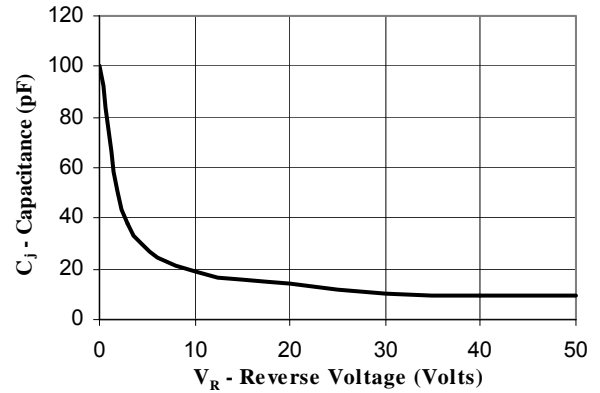


Figure 2 Capacitance vs Reverse Voltage

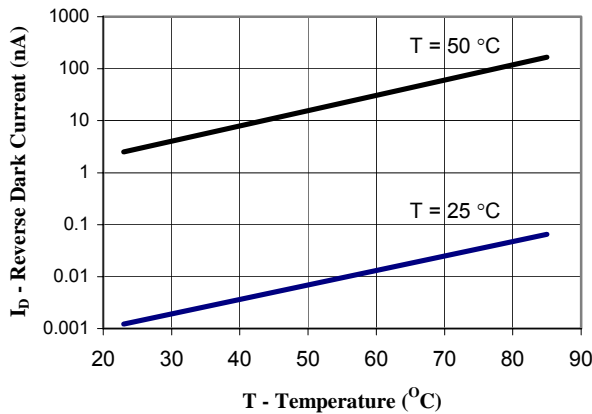


Figure 3 Reverse Current vs Temperature

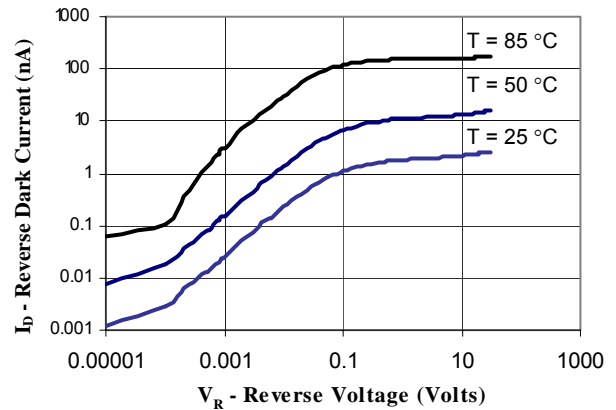


Figure 4 Reverse Current vs Reverse Voltage

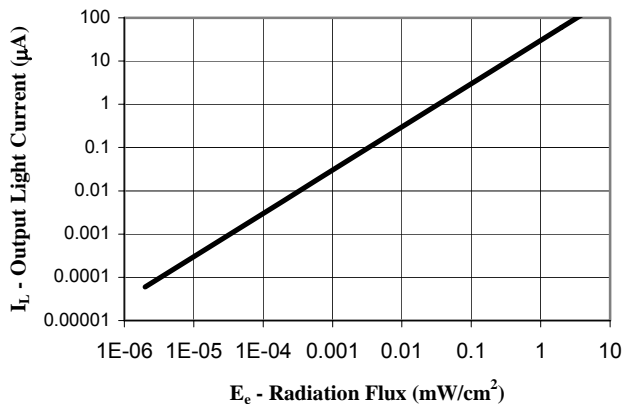


Figure 5 Light Current vs Irradiance @ $\lambda = 950 \text{ nm}$

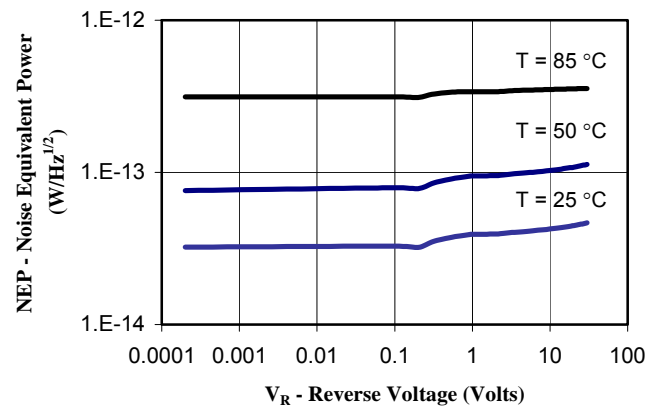
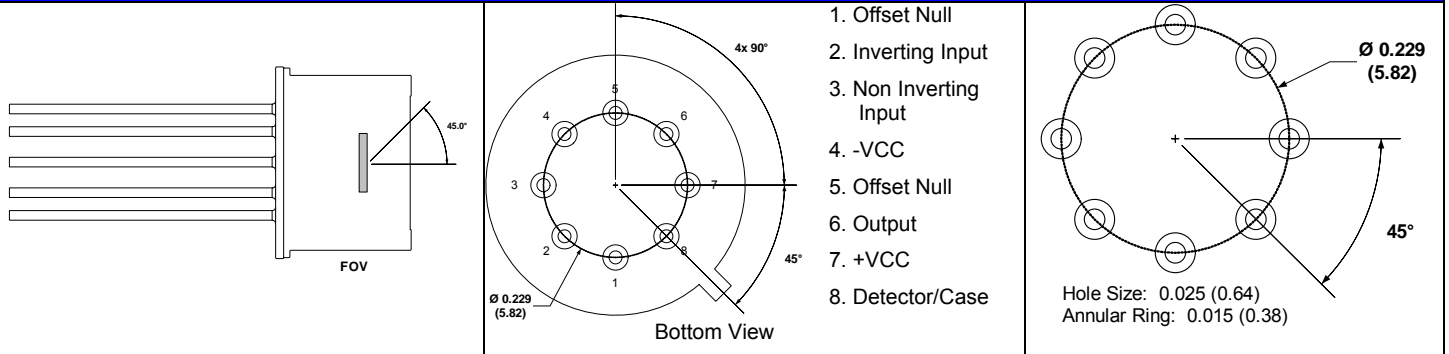


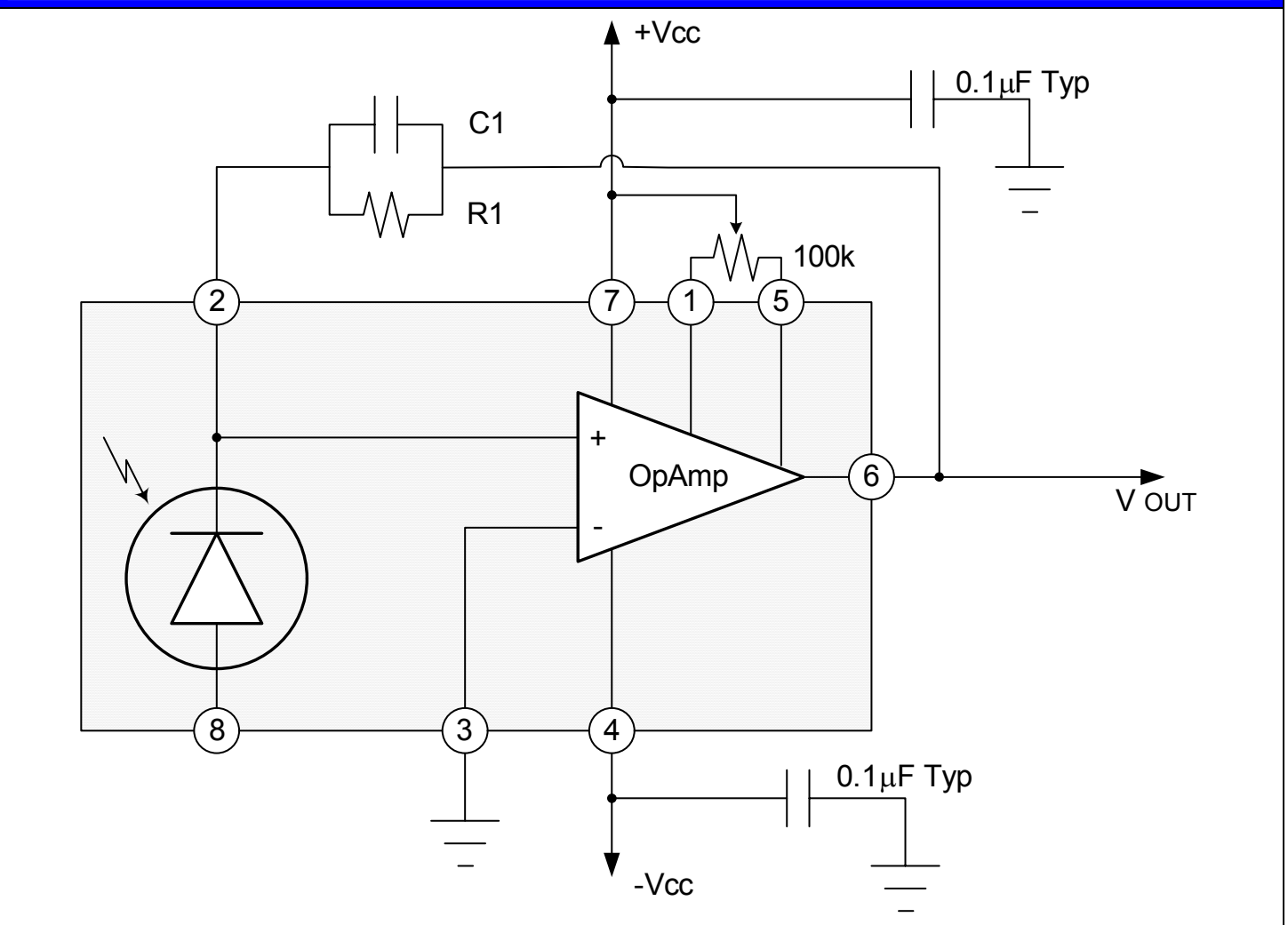
Figure 6 Noise Equivalent Power vs Reverse Voltage

Specifications are subject to change without notice. Please consult the website or factory for current information.

Package Specifications



Device Schematic



Note: The shaded area contains the contents of the SCA-005OP. The exterior components show a typical configuration.