

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.

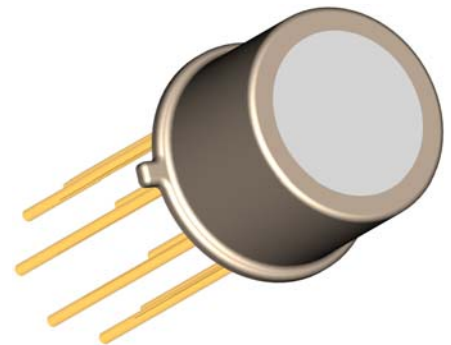
The standard version of model SCA-005OP is housed in a hermetically sealed electrically isolated 8 pin TO-39 metal case. It is also available in custom packages and in chip form for hybrid circuit boards.

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



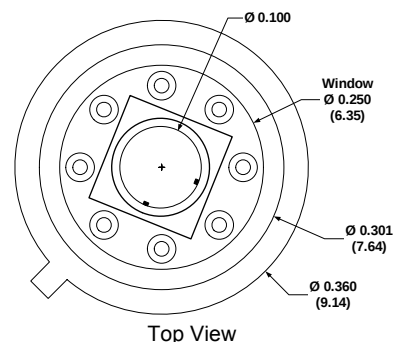
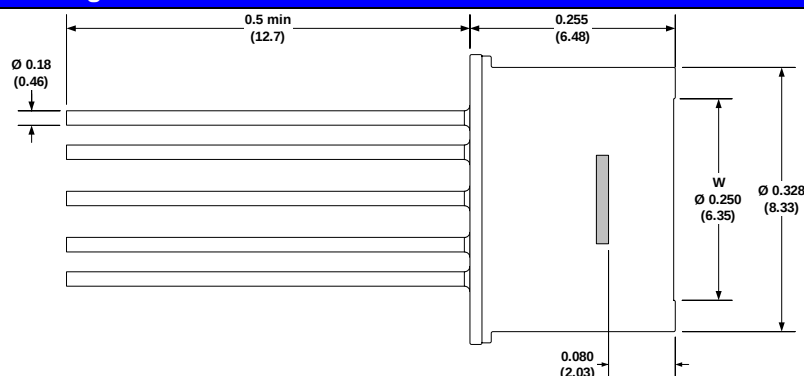
Features

- 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

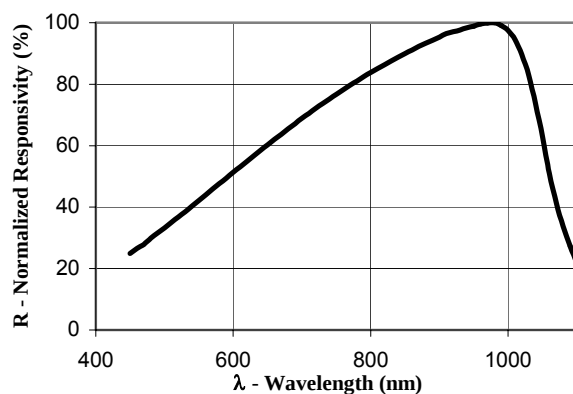


Figure 1 Responsivity vs Wavelength

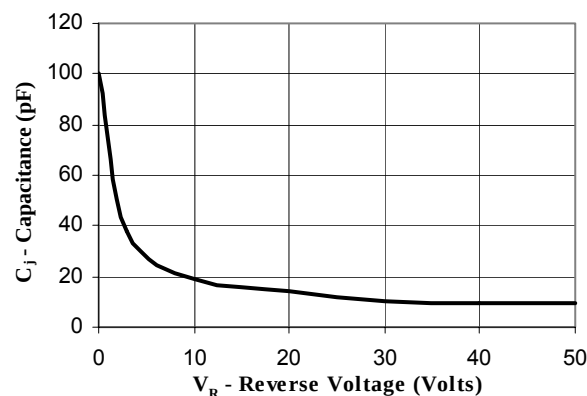


Figure 2 Capacitance vs Reverse Voltage

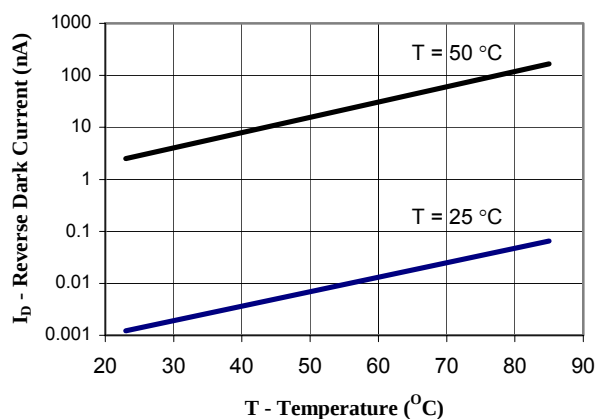


Figure 3 Reverse Current vs Temperature

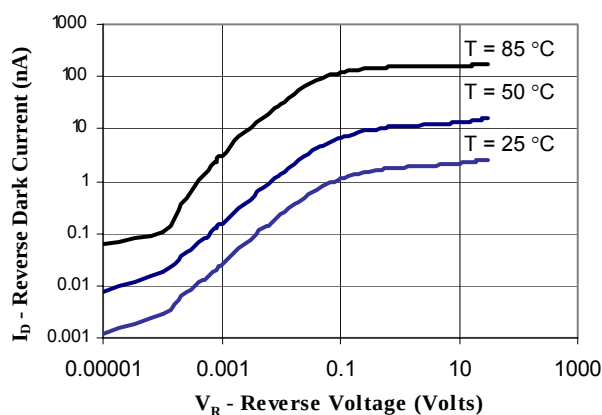


Figure 4 Reverse Current vs Reverse Voltage

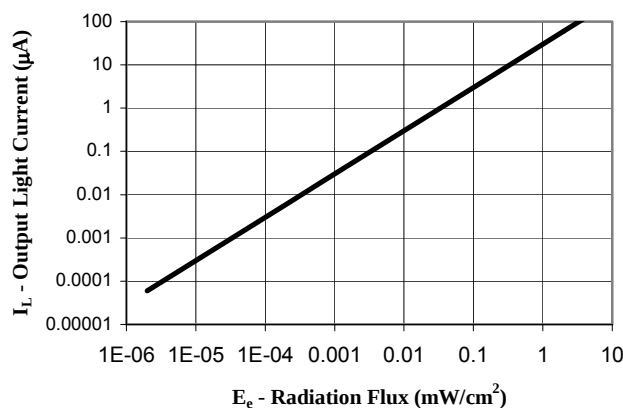


Figure 5 Light Current vs Irradiance @ $\lambda = 950 \text{ nm}$

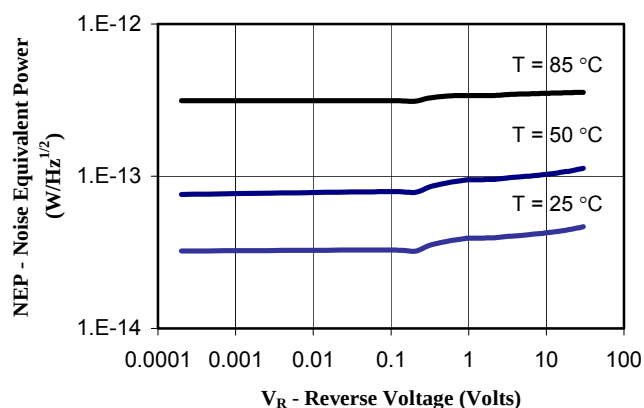
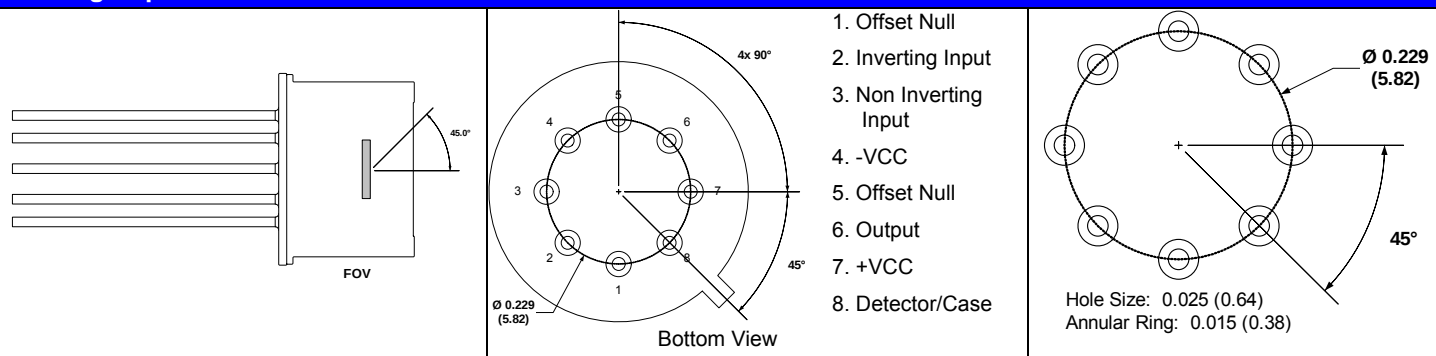


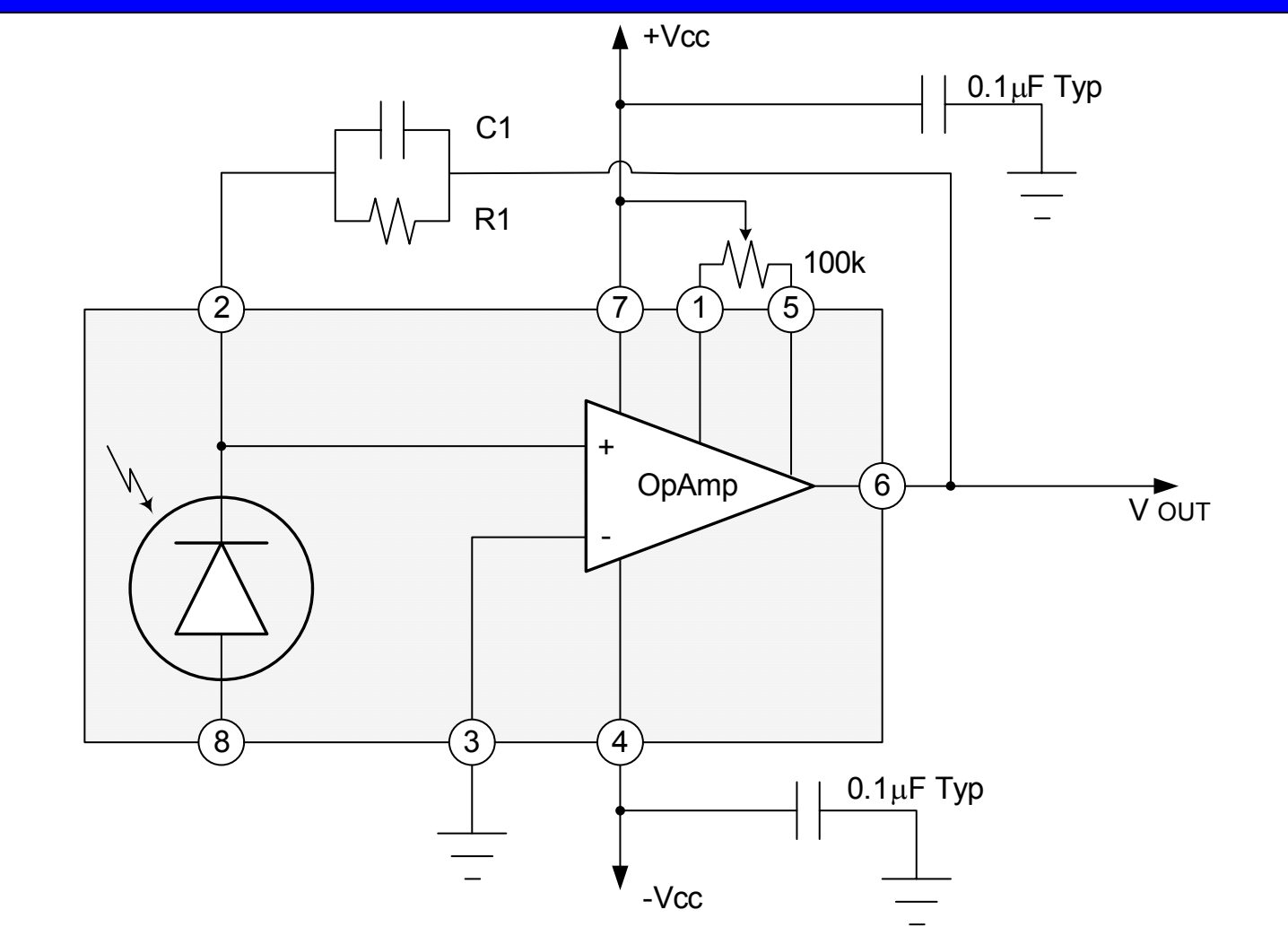
Figure 6 Noise Equivalent Power vs Reverse Voltage

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.