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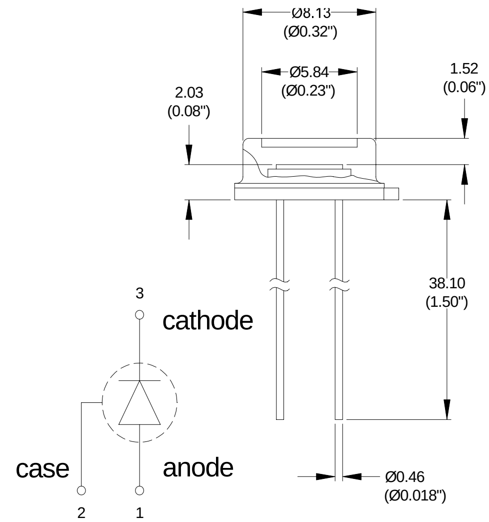
FDS100 Si Photodiode

High Speed
Large Active Area

The FDS100 is a high-speed silicon photodiode with a spectral response from 350nm to over 1100nm. This photodiode has a PIN structure that provides fast rise and fall times with a bias of 20V.



Electrical Characteristics

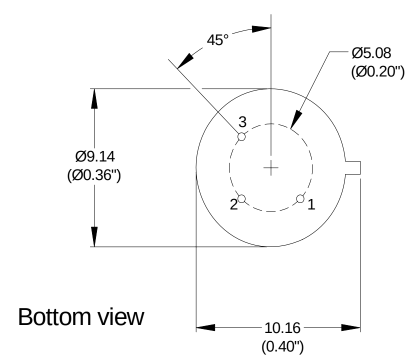
Spectral Response:	350-1100nm
Active Area:	$13.0mm^2$
Rise Time ($RL=50\Omega$):	10ns (20V bias)
Fall Time ($RL=50\Omega$):	10ns (20V bias)
NEP@900nm:	1.2×10^{-14} W/√Hz (@20V bias)
Dark Current:	20nA max (20V)
Package:	T05, 0.36" can

Maximum Ratings

Damage Threshold CW:	$100\ mW/cm^2$
Damage 10ns Pulse:	$500mJ/cm^2$
Max Bias Voltage:	25V

Pin Description

1. Detector anode
2. Detector case
3. Detector cathode



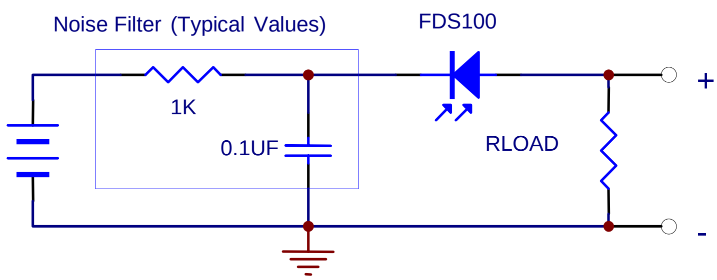
The Thorlabs FDS100 photodiode is ideal for measuring both pulsed and CW light sources, by converting the optical power to an electrical current. The Si detector is housed in a T05 can, with an anode, cathode and case connection. The photodiode anode produces a current, which is a function of the incident light power and the wavelength. The responsivity $\Re(\lambda)$, can be read from **Figure 1** to estimate the amount of photocurrent to expect. This can be converted to a voltage by placing a load resistor (R_{LOAD}) from the photodiode anode to the circuit ground. The output voltage is derived as:

$$V_o = P * \Re(\lambda) * R_{LOAD}$$

The bandwidth, f_{BW}, and the rise time response, t_R, are determined from the diode capacitance, C_J, and the load resistance, R_{LOAD}, as shown below. Placing a bias voltage from the photo diode cathode to the circuit ground can lower the photo diode capacitance.

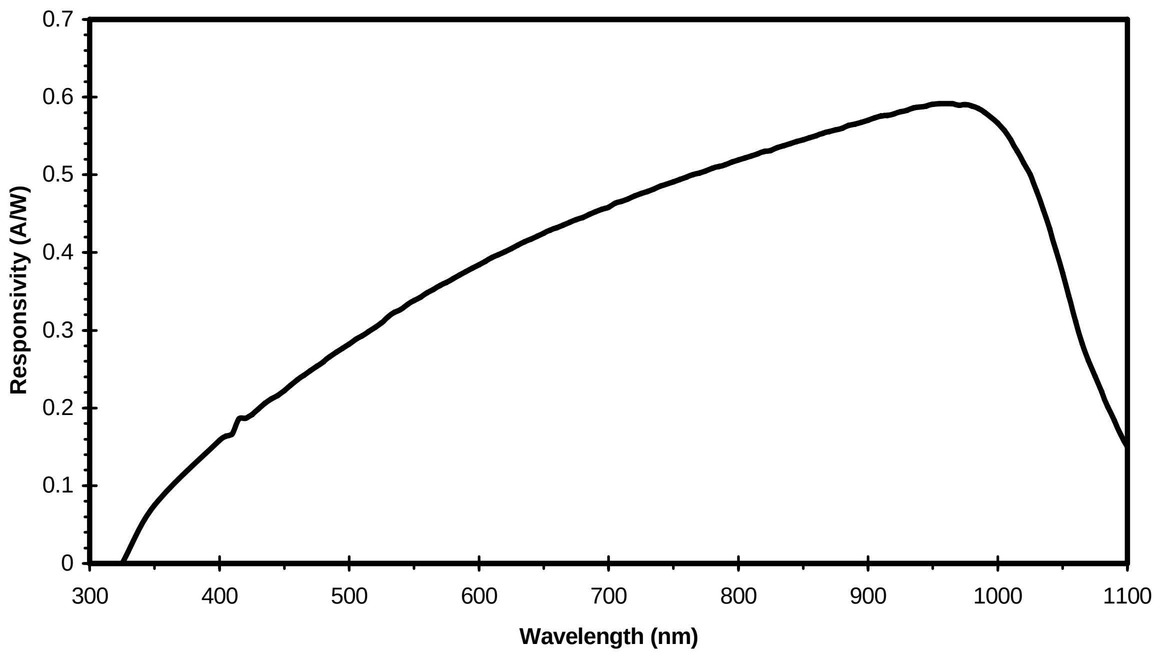
$$f_{BW} = 1/(2\pi * R_{LOAD} * CJ),\ t_R = 0.35/f_{BW}$$

Typical Circuit Diagram



Typical Plots

Figure 1 - FDS100 Spectral Responsivity Curve



Typical Responsivity Curve using Thorlabs calibration services.