

Silicon Photodiode

FDS10X10



Description

The Thorlabs FDS10X10, silicon photodiode is ideal for measuring both pulsed and CW fiber light with sensitivity from 340 to 1100 nm. The detector is housed in a ceramic package with an anode and cathode connection. Under reverse bias application, the photodiode anode produces a current, which is a function of the incident light power and the wavelength. The responsivity $\mathfrak{R}(\lambda)$, can be read from Figure 1 to estimate the amount of photocurrent per incident light energy. The photodiode current can be converted to a voltage by placing a load resistor (R_L) between the photodiode anode and the circuit ground. The output voltage is derived as:

$$V_o = P \times \mathfrak{R} \times R_L$$

The bandwidth, f_{BW} , and the rise time response, t_R , are determined from the diode capacitance, C_J , and the load resistance, R_L , as shown below. The diode capacitance can be lowered by placing a bias voltage from the photodiode cathode to the circuit ground.

$$f_{BW} = \frac{1}{(2\pi)R_L C_J}, t_R = \frac{0.35}{f_{BW}}$$

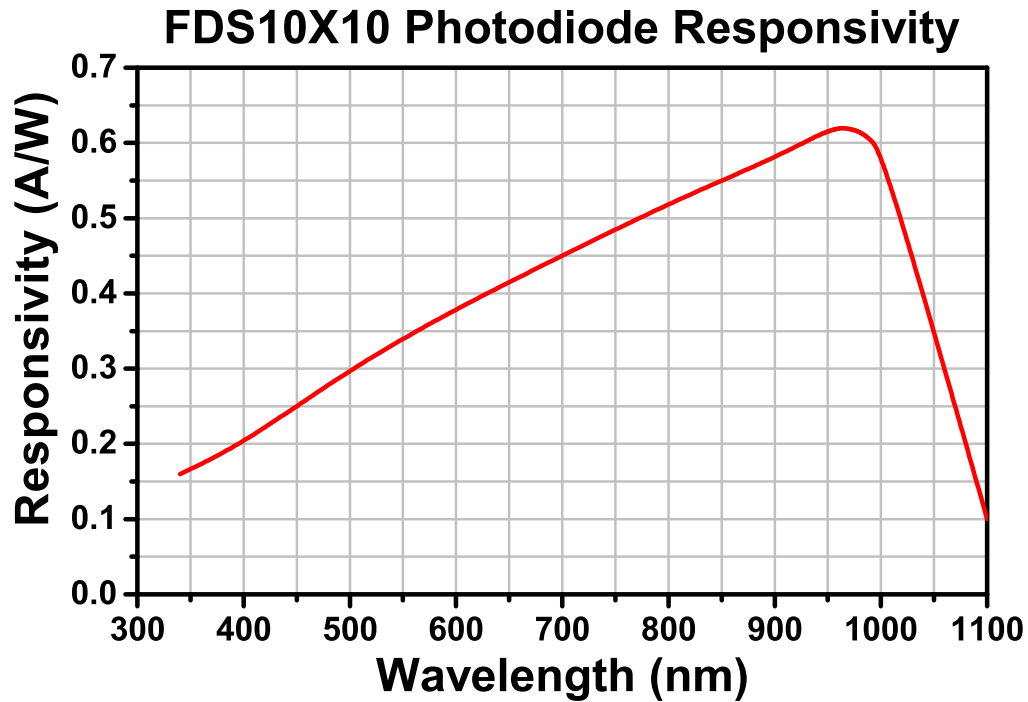
Specifications

Specification		Value
Wavelength Range	λ	340 - 1100 nm
Peak Wavelength	λ_p	960 nm
Responsivity	$\mathfrak{R}(\lambda_p)$	0.62 A/W
Active Area		100 mm ²
Rise/Fall Time ($R_L=50 \Omega$, 5 V)	t_r/t_f	150 ns / 150 ns
NEP, Typical (960 nm)	W//Hz	1.50×10^{-14}
Dark Current (5 V)	I_d	200 pA
Capacitance (5 V)	C_j	380 pF
Package		Ceramic
Sensor Material		Silicon (Si)

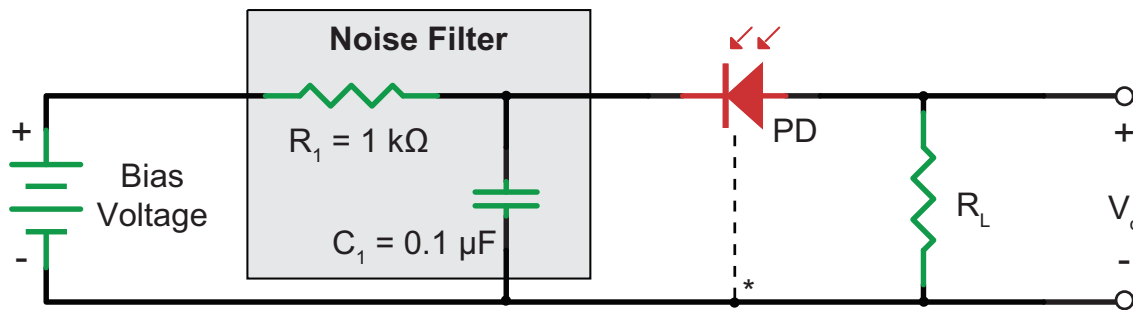
Maximum Rating	
Max Bias (Reverse) Voltage	5 V
Operating Temperature	-40 to +75 °C
Storage Temperature	-55 to +125 °C



Typical Spectral Intensity Distribution

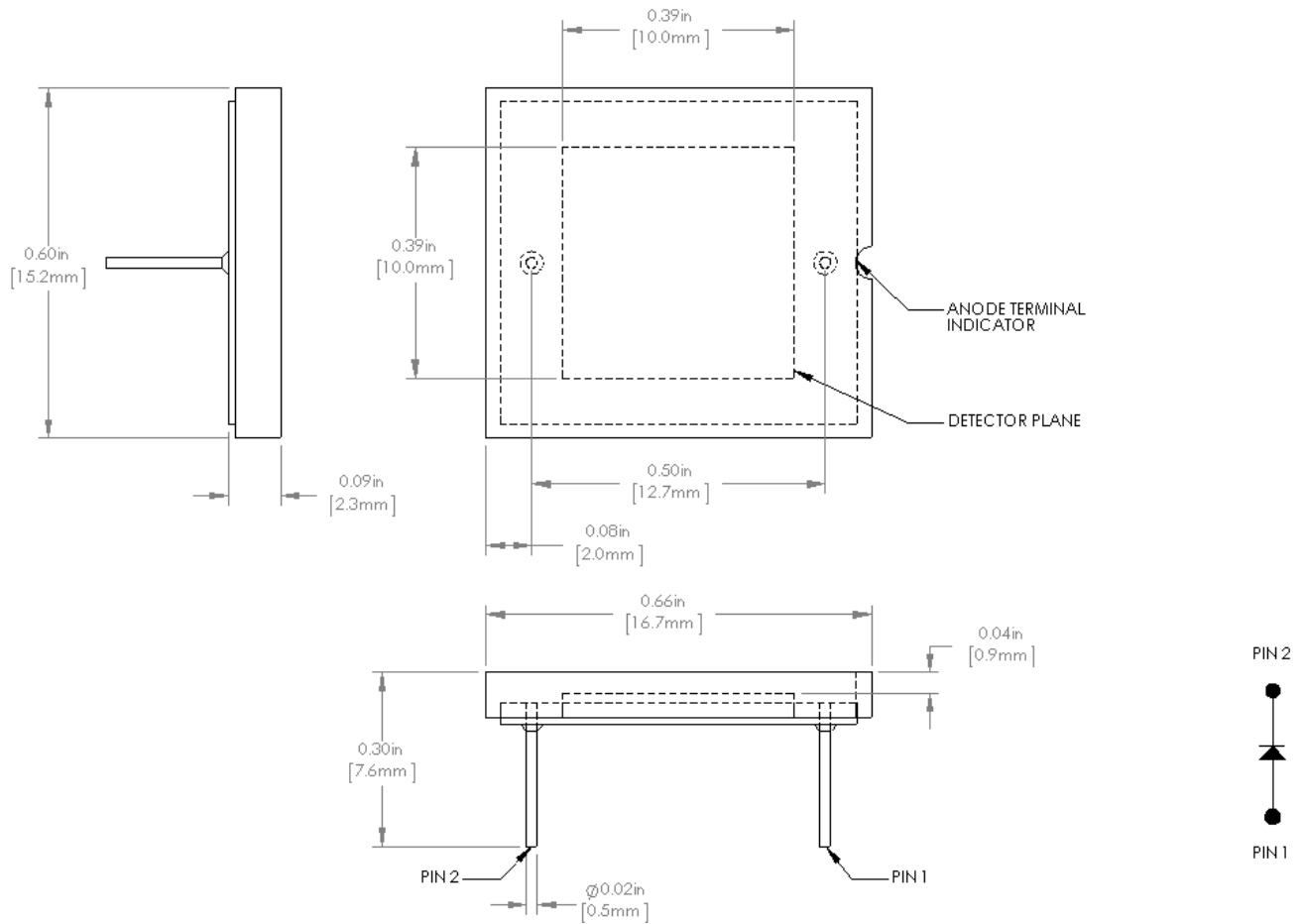


Recommended Circuit



* Case ground for PD with a third lead.

Drawing



Precautions and Warranty Information

These products are ESD (electrostatic discharge) sensitive and as a result are not covered under warranty. In order to ensure the proper functioning of a photodiode care must be given to maintain the highest standards of compliance to the maximum electrical specifications when handling such devices. The photodiodes are particularly sensitive to any value that exceeds the absolute maximum ratings of the product. Any applied voltage in excess of the maximum specification will cause damage and possible complete failure to the product. The user must use handling procedures that prevent any electro static discharges or other voltage surges when handling or using these devices.

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- 2. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety or effectiveness.*
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