FGA10 InGaAs Photodiode

**--**High Responsivity
--Low Capacitance: High Speed

Electrical Characteristics

Spectral Response:	800-1800nm*****
Active Diameter:	1.0mm
Rise/Fall Time (RL=50Ω):	5.0ns (5V)
Bandwidth (RL=50Ω, -3dB,5V):	40 MHz min
NEP@1550nm:	$1*10^{-14}$ W/√Hz min
Dark Current:	100nA max
	(25nA typ) @ 5V
Package:	TO-5

Maximum Ratings

Damage Threshold CW:	100mW
Max Bias Voltage:	20V
Storage Temperature:	-40 to 125° C
Operating Temperature:	-40 to 85° C
Reverse Current:	10mA
Forward Current:	10mA

TO-5

Bottom View
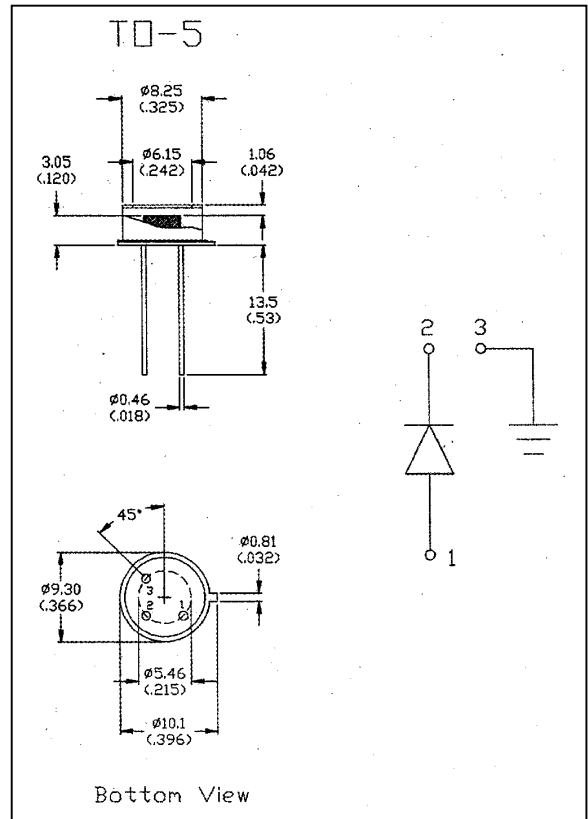
The Thorlabs FGA10 photodiode is ideal for measuring both pulsed and CW light sources, by converting the optical power to an electrical current. The InGaAs detector is housed in a TO-5 package with an anode, cathode and case connection. The photodiode anode produces a current which is a function of the 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:

$$Vo = P * \Re(\lambda) * R_{LOAD}$$
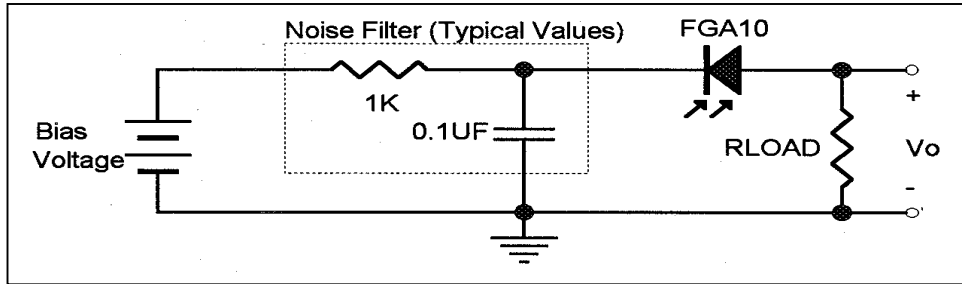
The bandwidth, f_{BW}, and the rise time response, T_R, are determined from the diode capacitance, C_J, and the load resistance, R_{LOAD}, as shown below. The diode capacitance can be lowered by placing a bias voltage from the photodiode cathode to the circuit ground. The effect of the bias voltage vs. Diode capacitance can be read from Figure 2.

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

Related Thorlabs Products
FDS010, FDS100, PDA55, PDA155, PDA255, PDA400, WS02, TM2448

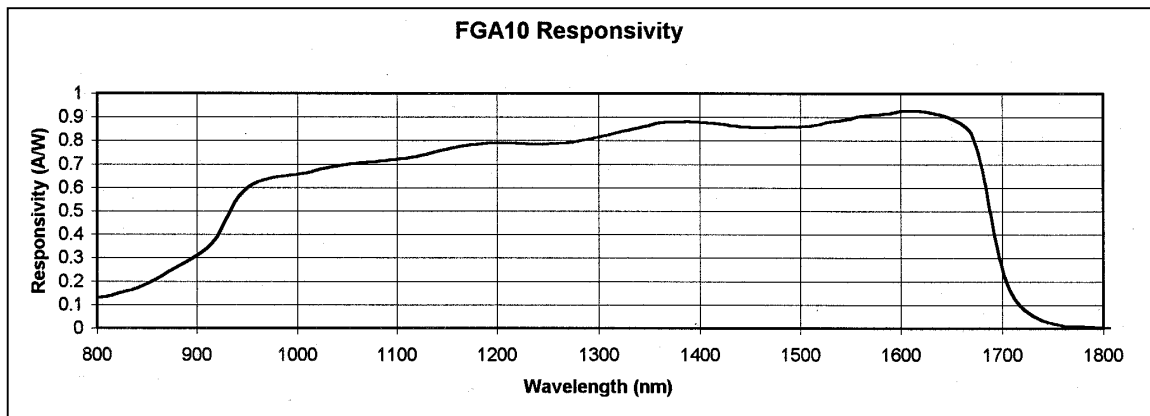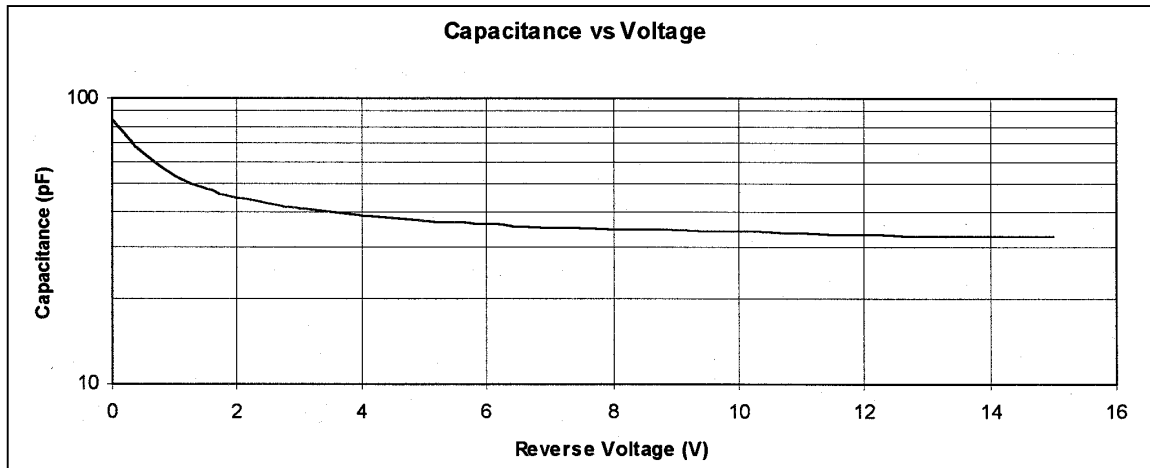## Typical Circuit Diagram

Typical Plots

Figure 1

Figure 2