THORLABS INC

435 Route 206 • P.O. Box 366
Newton, NJ 07860-0366

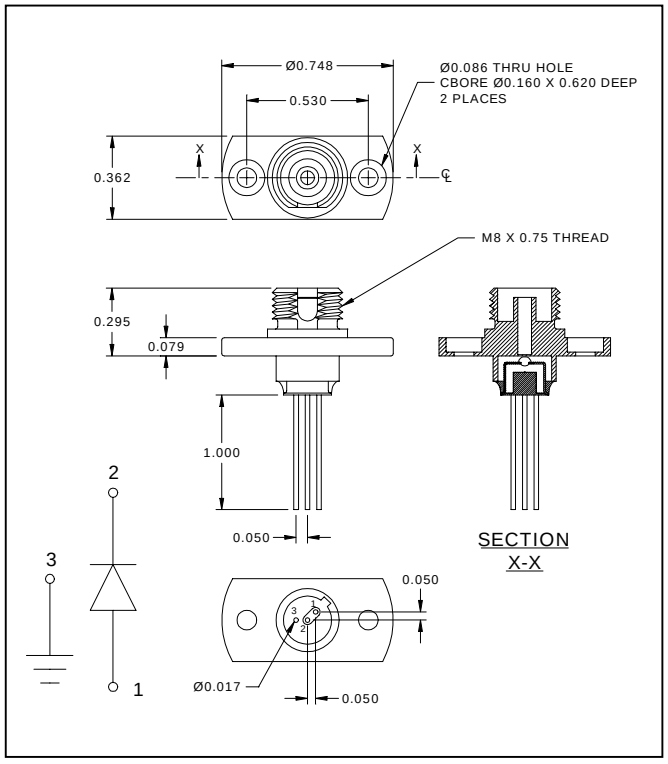
PH. 973-579-7227
FAX 973-300-3600

FGA04 InGaAs Photodiode

- High Responsivity
- Low Capacitance: High Speed
- Fiber Compatible with FC Connector

Electrical Characteristics

Spectral Response:	800-1700nm
Active Diameter:	100µm
Rise/Fall Time (RL=50Ω):	0.1ns min. @ (5V)
Bandwidth (RL=50Ω, -3dB,5V):	2GHz min. @ (5V)
NEP@1550nm:	$1.5*10^{-15}$ W/√Hz typ.
Dark Current @ (5V):	0.5nA typ. (1.0nA max)
Capacitance @ (5V):	1.0pF typ. (1.2pF max)
Package:	TO-46(mod) w/ FC Bulkhead Conn.



Maximum Ratings

Damage Threshold CW:	100mW
Max Bias (Reverse) Voltage:	25V
Storage Temperature:	-40 to 125° C
Operating Temperature:	-40 to 85° C
Reverse Current:	10mA
Forward Current:	10mA

Description

The Thorlabs FGA04 photodiode is ideal for measuring both pulsed and CW fiber light sources, by converting the optical power to an electrical current. The InGaAs detector is housed in a TO-46(mod) package with an anode, cathode and case connection, mounted in an FC bulkhead connector. 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:

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

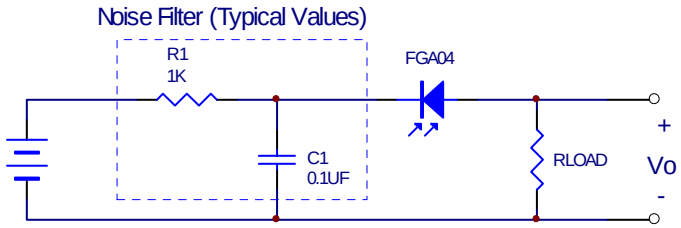
The bandwidth, f_{BW}, and the rise time response, T_R, are determined from the diode capacitance, C_J, and the load resistance, R_{LOAD}, as shown below. The diode capacitance can be lowered by placing a bias voltage from the photodiode cathode to the circuit ground. The effect of the bias voltage vs.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

D400FC, FGA10, Fiber Optic cables and Patch Cords, FC Connectors, and FC fiber polishing kits.

Typical Circuit Diagram



Typical Plots

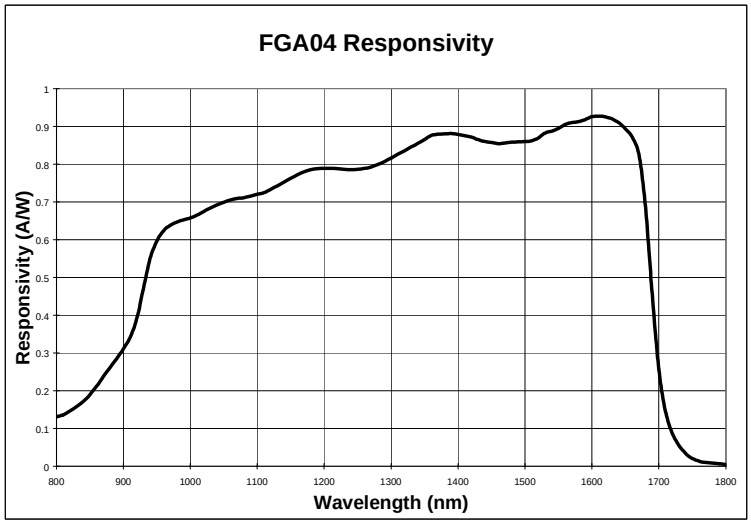


Figure 1

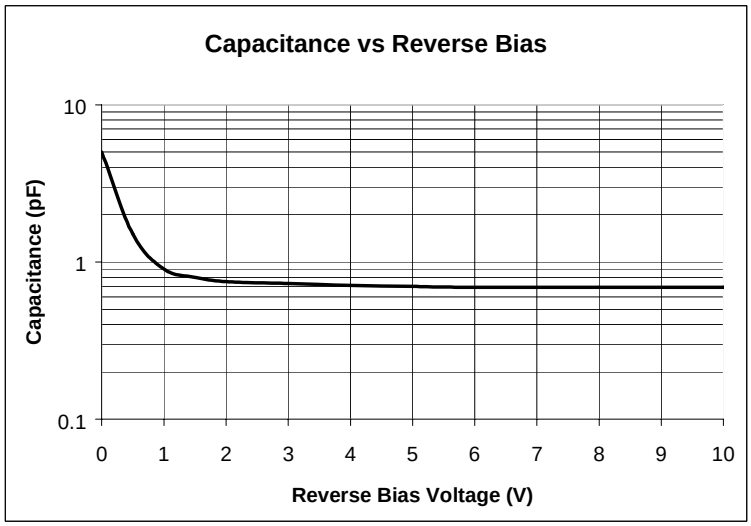


Figure 2