

D400FC InGaAs Fiber Optic Photo Detector

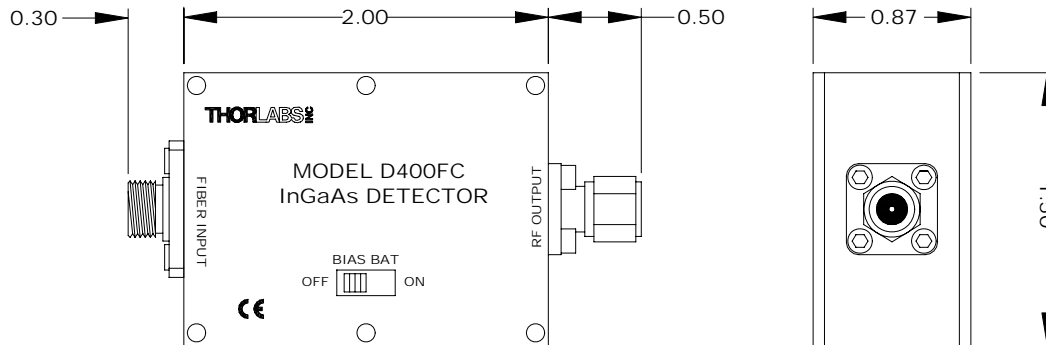
DESCRIPTION

Thorlabs DC400FC is a ready-to-use very high-speed photo detector. The unit comes complete with an FC/PC bulkhead connector / Detector and an internal 12V bias battery enclosed in a ruggedized insulated housing. A FC/PC type fiber optic bulkhead connector provides easy coupling to fiber based light sources. The output uses a SMA style jack for maximum frequency response.

SPECIFICATIONS

Detector: InGaAs Pin	Housing: Black Anodized Aluminum
Spectral Response: 800-1700nm	Size: 2.8" x 1.5" x 0.9"
Peak Response: 0.95 A/W @ 1550nm	Bias: 12V Battery (Type A23)
Rise/Fall Time: 0.1ns	Output: SMA Plug
Diode Capacitance: 0.7pF (typ)	Input: FC/PC bulkhead fiber connector
NEP @ 1550nm: $1.0 \times 10^{-15} \text{ W}/\sqrt{\text{Hz}}$	Ball Lens Size: $\varnothing 0.058"$ ($\varnothing 1.47 \text{ mm}$)
Dark Current: 0.7nA (typ) 1.0nA (max)	Reflective Index of lens: 1.482 @ 675nm
PD Active Diameter: 0.1 mm	Coupling Efficiency: 92% (typ) into both single and multi-mode fibers over full spectral response of detector.
Bandwidth: 1GHz (min)	Field of View (FOV): 48°
Operating Temp: 0 to 40°C	
Storage Temp: 0 to 40°C	
Damage Threshold: 70 mW (max)	

* Note: The D400FC is not compatible with FC/APC fiber connectors.



Reference Thorlabs Drawing No. 2121-E01 Rev B.
 All units in inches.

OPERATION

Thorlab's D400FC is ideal for measuring both pulsed and CW light sources. The unit includes a reverse biased PIN photo diode, 12V bias battery, ON/OFF switch, and a FC bulkhead connector, all packaged in a ruggedized housing. The SMA output signal is the direct photocurrent out of the photo diode anode and is a function of the incident light power and wavelength. The Responsivity, $\mathfrak{R}(\lambda)$, can be read from Figure

1 to estimate the amount of photocurrent to expect. Most users will wish to convert this photocurrent to a voltage for viewing on an oscilloscope or DVM. This is accomplished by adding an external load resistance, R_{LOAD} . The output voltage is derived as:

$$V_O = P * \mathfrak{R}(\lambda) * R_{LOAD}$$

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} :

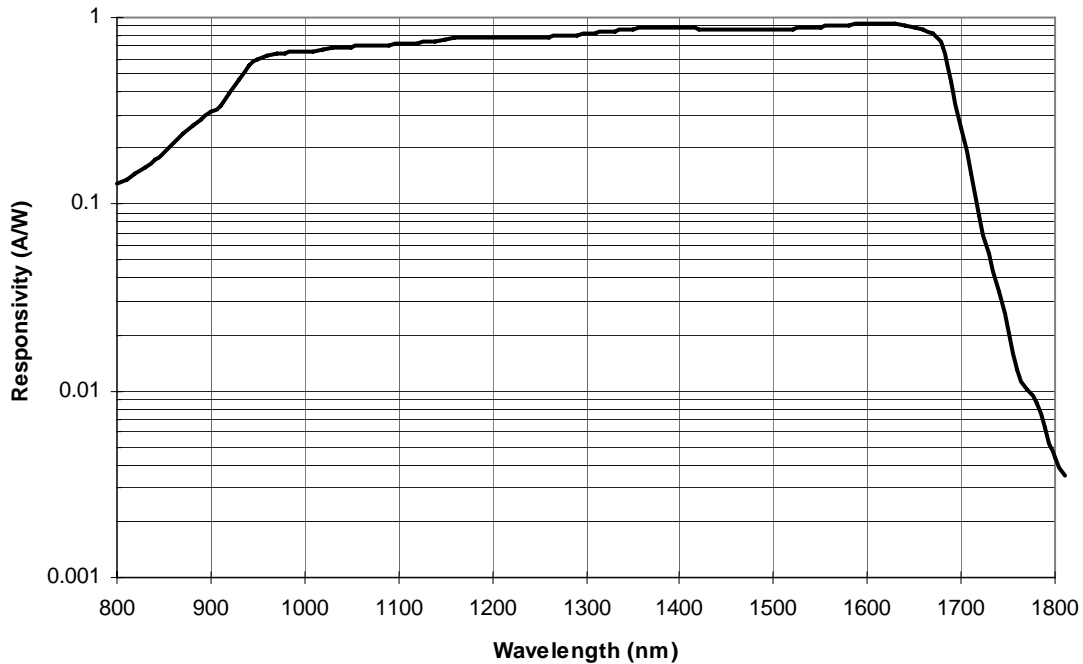
$$f_{BW} = 1/(2\pi * R_{LOAD} * C_J), T_R = 0.35/f_{BW}$$

For maximum bandwidth, we recommend using a direct connection to the measurement device having a 50Ω input impedance. If this is not possible, an SMA - SMA cable with a 50Ω terminating resistor at the end can be used. This will also minimize ringing by matching the coax with its characteristic impedance. If bandwidth is not important, you can increase the amount of voltage for a given input light by increasing the R_{LOAD} up to a maximum of $10k\Omega$

Also Available: Misc. SMA adapters (*T4285, T4291, T4289*), Misc. SMA coax cables (*T4846-BB-24, T4846-BB-48, T4813-BB-24, T4813-BB-48, T4935-BB-24, T4935-BB-48*), fiber pigtailed InGaAs detectors (*FGA03, FGA10*)

Note: The detector has an AC path to ground even with the switch in the off position. It is normal to see some output response to an AC signal with the switch in this state. However, because the detector is unbiased, operation in this mode is not recommended.

FGA10 Responsivity



Battery Replacement

To replace the battery:

1. Turn the D400FC Bias Bat switch to OFF.
2. Remove the 6 Phillips flat head screws used to secure the top cover.
3. Remove the existing battery from the unit.
4. Place the new A23 12V battery in the battery socket. Make sure the battery is positioned so that the positive terminal is pointed toward the + on the battery socket.
5. Secure the top cover using the 6 screws.

A replacement battery can be purchased through Thorlabs. The part number to reference is A23.

WEEE

As required by the WEEE (Waste Electrical and Electronic Equipment Directive) of the European Community and the corresponding national laws, Thorlabs offers all end users in the EC the possibility to return “end of life” units without incurring disposal charges.

This offer is valid for Thorlabs electrical and electronic equipment

- sold after August 13th 2005
- marked correspondingly with the crossed out “wheelie bin” logo (see fig. 1)
- sold to a company or institute within the EC
- currently owned by a company or institute within the EC
- still complete, not disassembled and not contaminated

As the WEEE directive applies to self contained operational electrical and electronic products, this “end of life” take back service does not refer to other Thorlabs products, such as

- pure OEM products, that means assemblies to be built into a unit by the user (e. g. OEM laser driver cards)
- components
- mechanics and optics
- left over parts of units disassembled by the user (PCB’s, housings etc.).

If you wish to return a Thorlabs unit for waste recovery, please contact Thorlabs or your nearest dealer for further information.

Waste treatment on your own responsibility

If you do not return an “end of life” unit to Thorlabs, you must hand it to a company specialized in waste recovery. Do not dispose of the unit in a litter bin or at a public waste disposal site.

Ecological background

It is well known that WEEE pollutes the environment by releasing toxic products during decomposition. The aim of the European RoHS directive is to reduce the content of toxic substances in electronic products in the future.

The intent of the WEEE directive is to enforce the recycling of WEEE. A controlled recycling of end of live products will thereby avoid negative impacts on the environment.



Crossed out “wheelie bin” symbol