

Amplified InGaAs Fiber Optical Detector

10⁴ High Gain, 100MHz, Gain Switchable, 800-1660nm



DATASHEET

[Return to the Webpage](#)



The AFOD series detectors offer a user-friendly photodiode package with an integrated high-gain, low-noise analog transimpedance amplifier, optimized for applications requiring high bandwidth and ultra-fast response times (<1 ns). These detectors feature a manually switchable gain with four settings: 660, 1020, 2000, and 20000, to maximize the signal-to-noise ratio, ideal for detecting low-level optical beat signals at frequencies up to 100 MHz. The AFOD detectors come with fiber optical FC inputs and an M4 tapped hole in the housing for easy post mounting.

Each unit includes a low-noise ± 12 V linear power supply, with replacements available separately.

Features

- Ultra-High Gain
- Adjustable Gain
- 0-5V Analog Output
- Mountable Unit
- Power Supply Included

Applications

- Optical System
- Lab Use
- Instruments

Specifications

Parameter	Min	Typical	Max	Unit
Center Wavelength	800		1660	nm
Rise/Fall Time	0.2			ns
Bandwidth	DC		100	MHz
Saturation Limit			5	mW
Noise (rms)			50	μ V
Gain			10 ⁴	
NEP			2	pW/Hz ^{0.5}
Output Impedance		50		Ohm
Output Coupling		DC		
Output	0		5	V
Output Connector		SMA		
DC Power Input		± 12		V
Operating Temperature	-20	23	65	$^{\circ}$ C
Storage Temperature	-50		85	$^{\circ}$ C
Optical Input Connector		FC		

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Rev 10/28/24

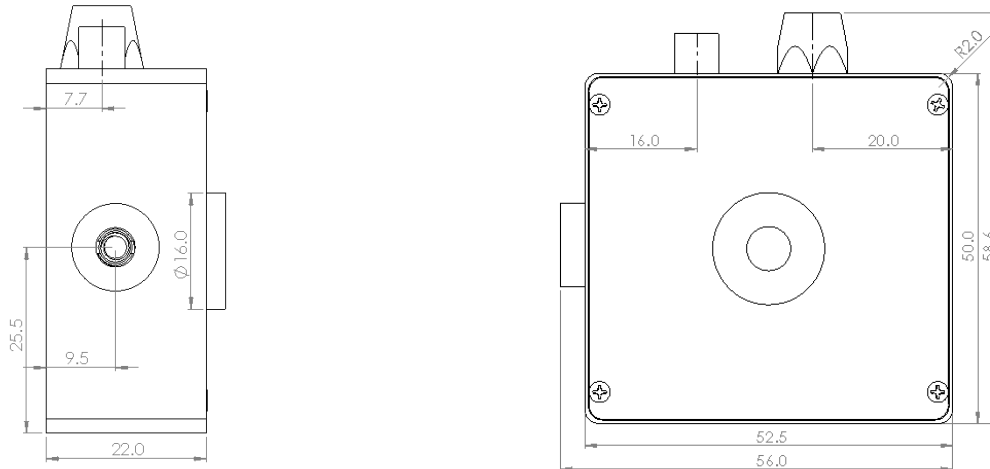
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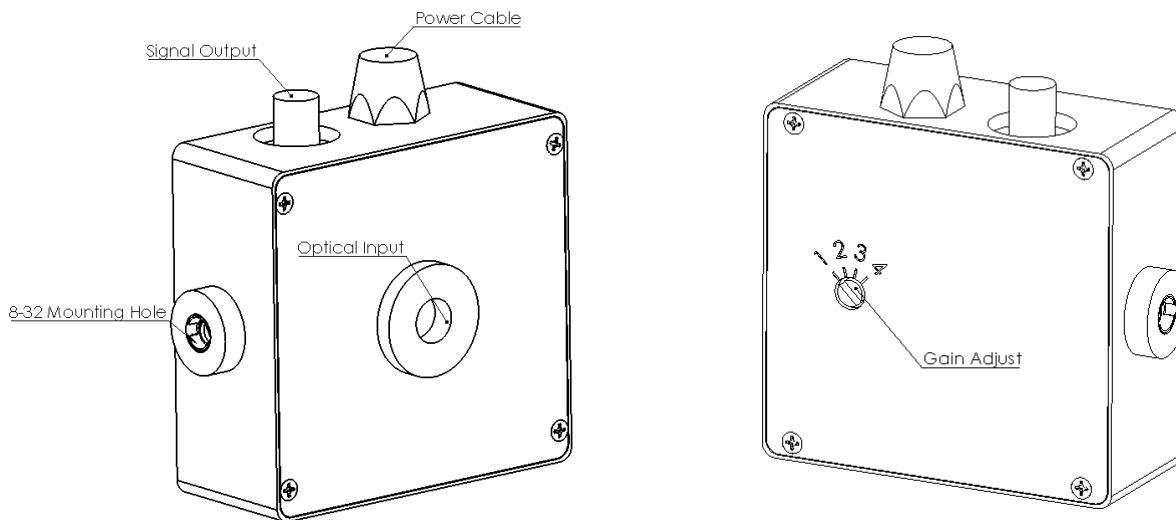


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Mechanical Dimensions (mm)



Operation Instruction



To operate the AFOD series detector:

- **Power Connection:** Attach the $\pm 12V$ power supply to the power cable using the included connector. Once powered on, an LED indicator will illuminate, confirming proper operation. A recommended power supply is available for purchase as a replacement if needed.
- **Output Connection:** Use a 50 Ω coaxial cable with an SMA male connector to link the detector output to your measurement instrument.
- **Light Source and Gain Adjustment:** Direct a suitable light source to the detector. Adjust the gain to the desired level, selecting from 10 to 70 dB in 10 dB increments to optimize your signal.
- **Mounting:** Each unit features an 8-32 mounting hole on the side for secure integration into your setup.

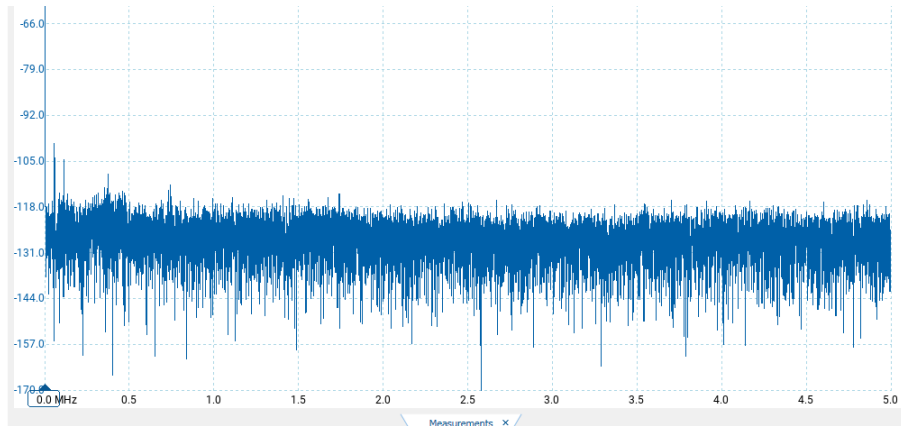
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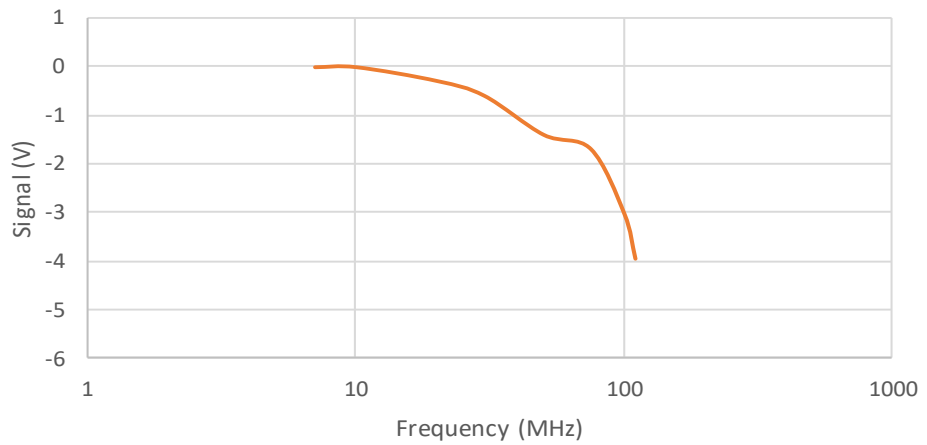


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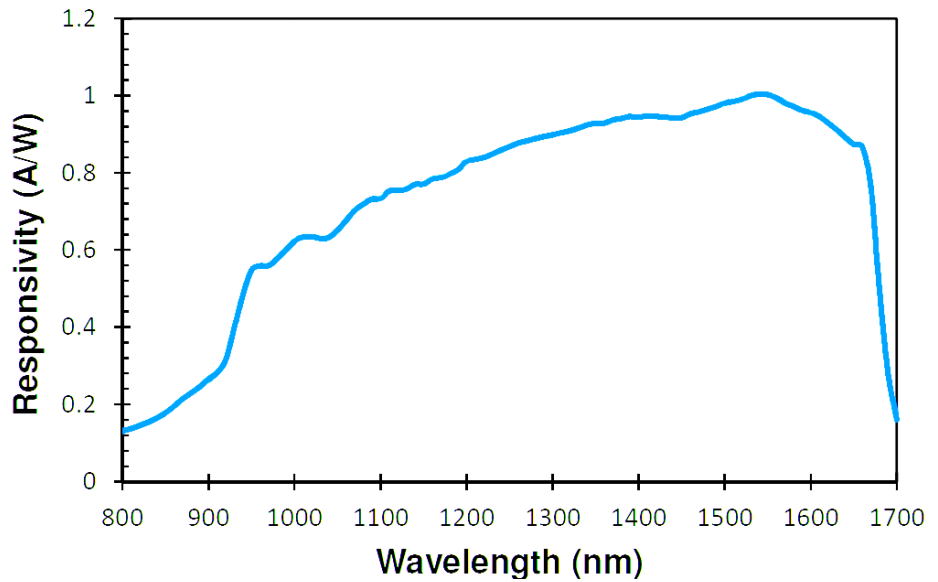
Noise (<100dB)



Frequency Response



Spectral Response



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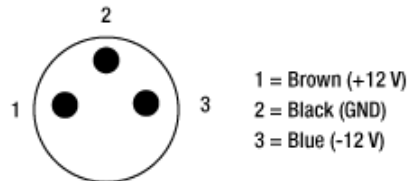


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Ordering Information

Prefix	Type	Bandwidth	Grade	Package	Power Supply*
AFOD-	InGaAs = 1	100MHz = 0100	Regular = 1	Regular = 1 Special = 0	Included = 1 None = 2 Replacement = 3

Replacement: purchase the power supply only, no detector.



\$85

Application Notes

Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness

Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power

Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the handling by expanding the core side at the fiber ends.