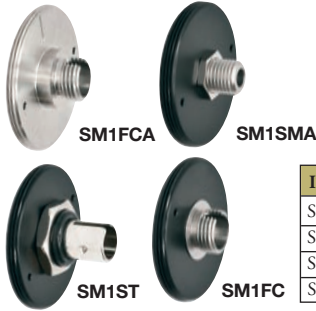


Fiber Adapters



While the Femtowatt Amplified Photodetectors on the previous page are designed for free space use, these fiber adapters can be threaded into the detector housing for fiber applications. Each adapter features external SM1 (1.035"-40) threading. Adapters are available for FC/PC, FC/APC, SMA, or ST fiber connectors.

ITEM #	\$	£	€	RMB	DESCRIPTION
SM1FC	\$ 27.00	£ 19.44	€ 23,49	¥ 215.19	External SM1 to FC Fiber Connector Adapter
SM1FCA	\$ 30.00	£ 21.60	€ 26,10	¥ 239.10	External SM1 to FC/APC Fiber Connector Adapter
SM1SMA	\$ 27.00	£ 19.44	€ 23,49	¥ 215.19	External SM1 to SMA Fiber Connector Adapter
SM1ST	\$ 27.00	£ 19.44	€ 23,49	¥ 215.19	External SM1 to ST Fiber Connector Adapter

Avalanche Photodetectors (Page 1 of 2)

Features

- 3 Wavelength Ranges: 200 – 1000 nm, 400 – 1000 nm, or 900 – 1700 nm
- Ultra Low Noise (APD110A: 0.16 pW/√Hz)
- DC to 50 MHz Bandwidth
- High Sensitivity (See Specs Below)
- Power Supply Included

Thorlabs' APD110 series of Avalanche Photodetectors are designed to offer increased sensitivity and lower noise compared to standard PIN detectors, making them ideal for applications with low optical power levels. These photodetectors combine an avalanche photodiode (Silicon or InGaAs) with a specially designed ultra low noise transimpedance amplifier for detection of light signals from DC to 50 MHz. The included active lowpass filter suppresses out-of-band noise effectively; it passes low-frequency signals but reduces the amplitude of signals with frequencies higher than the cutoff frequency, thereby enhancing performance.

These photodetectors offer exceptional low NEP and high transimpedance gain, making them ideal for fast low-light-level detection applications. The APD110A and the APD110A2 multiplication factor (M-factor) is factory set to 50, which will increase the responsivity by a factor of 50. For APD110C, the M-factor is factory set to 10. Please note that the M-factor is temperature dependent with lower temperatures increasing the M-factor and vice versa. Factory settings are established at ambient temperature (T = 23 °C).

Specifications*

ITEM #	APD110A	APD110A2	APD110C
Detector Type	Silicon APD	UV Enhanced Silicon APD	InGaAs APD
Wavelength Range	400 – 1000 nm	200 – 1000 nm	900 – 1700 nm
Peak Responsivity	25 A/W @ 800 nm M = 50	25 A/W @ 600 nm M = 50	9 A/W @ 1500 nm M = 10
Active Detector Diameter	1 mm		0.2 mm
Transimpedance Gain	100 kV/A for HiZ, 50 kV/A with 50 Ω Termination		
Conversion Gain (Max)	2.5 x 10 ⁶ V/W		0.9 x 10 ⁶ V/W
Output Bandwidth (3 dB)	DC – 50 MHz		
CW Saturation Power	1.5 μW		4.2 μW
Input Power (Max)**	1 mW		
NEP (Min)	0.16 pW/√Hz	0.18 pW/√Hz	0.46 pW/√Hz
Electrical Output	BNC, 50 Ω		
Output Voltage Threshold (Max)	3.6 V		
DC Offset Electrical Output	< ±15 mV		
Dimensions (W x H x D)	50.8 mm x 76.2 mm x 27.9 mm (2.0" x 3.0" x 1.1")		
Power Supply (Included)	±12 V @ 200 mA (110/230 V Switchable)		

*All data is valid at 23 ± 2 °C and 45% ± 15% Humidity **This value is the damage threshold for the Avalanche photodiode. Carefully shield the photodetector from unwanted light sources.

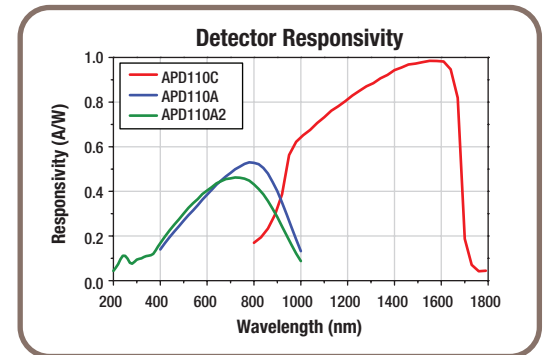
NEW
product

APD110A2
Includes SM1 End Cap
(Post Not Included)



Applications

- Spectroscopy
- Fluorescence Measurements
- Laser Radar
- Optical Rangefinders



Mounting Options

Our avalanche photodetectors have a compact housing that is designed such that the output and power leads are located perpendicular to the light path. In addition, each housing is equipped with both external SM1 (1.035"-40) and internal SM05 (0.535"-40) threads, making it compatible with our SM-threaded accessories. The detector housing has 8-32 (M4) tapped mounting holes on three sides so that it can be mounted onto a post with the leads pointing to the left, to the right, or upward.



Avalanche Photodetectors (Page 2 of 2)



APD vs. PIN Photodiode

When determining whether to purchase an avalanche photodiode (APD) or traditional PIN photodiode, consider the signal-to-noise ratio of the entire system. In traditional PIN photodiodes, incoming light creates charge carriers (electron-hole pairs) that supply a measurable photocurrent. The outputted current will be proportional to the incident light intensity. In contrast, APDs use an electric field to accelerate each charge carrier released by the photoelectric effect,

allowing each one to create more charge carriers through a process called impact ionization. This internal multiplication (i.e., avalanche effect) allows for higher gains to be realized. For an APD, the optimum internal gain corresponds to the situation where the detector noise is nearly equal to the input noise of the secondary amplifier so that the APD does not affect the system noise. APDs are preferred over standard PIN diodes whenever low-light intensities need to be detected.

PHOTODIODE	PIN	AVALANCHE
		
Peak Responsivity (Typical)	0.6 – 1 A/W	9 – 25 A/W
Reliability	10 ¹¹ h	10 ⁶ h
Voltage	Low	High
Cost	Low	High
Application	High Speed, Short Range Communication	Long Range Communication, Fiber Cable Test and Measurement

ITEM #	METRIC ITEM #	\$	£	€	RMB	DESCRIPTION
APD110A	APD110A/M	\$ 1,034.50	£ 744.80	€ 900,00	¥ 8,244.97	Avalanche Photodetector, Si, 400 – 1000 nm
APD110A2	APD110A2/M	\$ 1,034.50	£ 744.80	€ 900,00	¥ 8,244.97	Avalanche Photodetector, UV Enhanced Si, 200 – 1000 nm
APD110C	APD110C/M	\$ 2,078.70	£ 1,496.70	€ 1,808,50	¥ 16,567.24	Avalanche Photodetector, InGaAs, 900 – 1700 nm

8 GHz Amplified Photodetector



PDA8GS

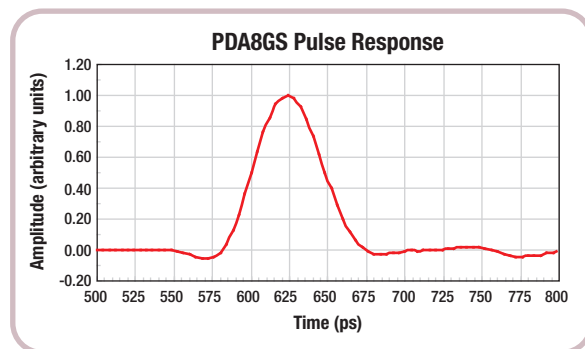
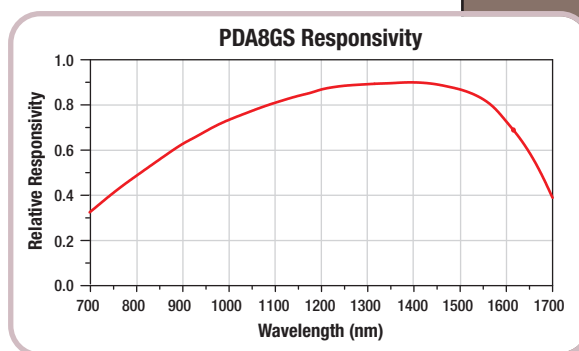
Specifications

- **Spectral Response:** 700 - 1650 nm
- **Bandwidth:** 9.5 GHz
- **Data Rate:** 10.7 Gb/s
- **Low Frequency Cutoff:** DC
- **Conversion Gain**
 - 275 V/W @ 850 nm
 - 450 V/W @ 1310 nm
- **Sensitivity**
 - -17 dBm @ 850 nm
 - -20 dBm @ 1310 nm
- **Optical Return Loss:** -14 dB (Max)
- **Rise Time:** 50 ps
- **Input Connector:** FC/PC
- **Output Impedance:** 50 Ω
- **Output Connector:** SMA
- **Package Size:** 3.0" x 2.4" x 1.1" (76.2 mm x 60.5 mm x 27.9 mm)
- **Power Supply (Included):** 12 VDC, 750 mA, 100/230 VAC 50/60 Hz
- **Mounting:** 8-32 and M4 x 0.7

Introduction

The PDA8GS is a versatile, high-speed, amplified photodetector designed to perform in a wide range of test and measurement applications involving fast optical signals. The detector's 9.5 GHz bandwidth and high sensitivity make it an ideal measurement instrument for both pulse response measurements in the time domain and frequency response measurements in the frequency domain. The wide bandwidth makes it ideal for evaluating pulsed laser and high-frequency modulation applications. Communication applications include 10 Gb Ethernet, OC192, and analog satellite microwave systems.

The unit incorporates a high-performance InGaAs PIN photodiode coupled with a transimpedance amplifier (TIA) that has a gain of 450 V/A and a maximum input power of 20 mW (peak-to-peak) for 60 ms or 1.0 mW (CW). The 50 Ω output is DC coupled through a female SMA connector. For applications that require AC coupling, an external DC block (feed through SMA) can be ordered with the unit (T8535). The fiber input is an FC/PC connector. This detector uses an internal Ø62.5 μm multimode fiber for easy coupling into the receiver.



For AC Coupling, consider our...

DC Block Adapter



T8535

The T8535 is a wide-bandwidth DC blocking filter incorporated directly into an SMA feed-through connector.

- ◆ **-3 dB Bandwidth:** 7 kHz to 23 GHz
- ◆ **Impedance:** 50 Ω
- ◆ **Insertion Loss**
 - 100 kHz to 12.4 GHz: 0.5 dB (Max)
 - 12.4 to 23 GHz: 0.75 dB (Max)

ITEM #	\$	£	€	RMB	DESCRIPTION
PDA8GS	\$ 3,998.00	£ 2,878.56	€ 3,478.26	¥ 31,864.06	Amplified Photodetector, 9.5 GHz, 700 – 1650 nm
T8535	\$ 96.90	£ 69.77	€ 84,30	¥ 772.29	Female-to-Male SMA DC Block, 7 kHz to 23 GHz