

APD Series of High-Sensitivity Avalanche Photodetectors



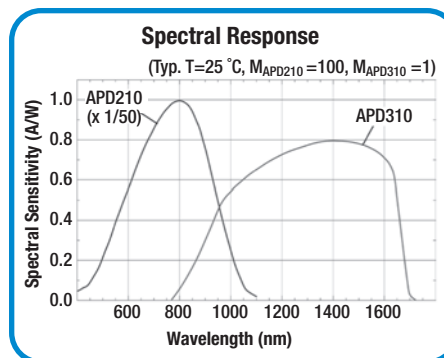
APD310

Applications

- Detection of Fast Laser Pulses
- For Beat Signals of Low-Level Inputs
- LIDAR (Light Detection and Ranging)
- Testing of Optical Components

Menlo Systems' Avalanche Photodetector (APD) series provides an extremely light-sensitive alternative to traditional PIN photodiodes. The APDs are sensitive and fast enough for the characterization of pulsed lasers on the order of nanoseconds. The silicon avalanche photodiode of the APD210 provides exceptional performance for low-light applications in the 400 - 1000 nm range, while the APD310 covers the InGaAs range of 850 - 1650 nm. The APD maintains high-gain stability over the operating temperature range by utilizing a temperature-compensation circuit, which adjusts the ~150 VDC bias to ensure operation near the breakdown voltage.

A 40 dB gain amplifier is integrated into the package and is AC-coupled to band the output BNC. The output is matched to a 50 Ω impedance. The detector has an electronic width of 1 MHz to 1 GHz and offers a user-accessible potentiometer, providing a continuous gain adjustment. The APD series has SM05 (0.535"-40) threads for easy integration into Thorlabs' entire family of lens tubes and cage assemblies. The bottom of the detector has a metric (M4) mounting hole and an M4 to 8-32 adapter is provided for post mounting. The compact packaging allows the APD to be substituted directly into an existing setup while maintaining a small footprint on the benchtop. These photodetectors are not suitable for pulses longer than 30 ns or continuous light levels. Please see the FPD510 series on page 1541 for alternatives.



Features

- High-Speed Response up to 1 GHz
- Continuously Adjustable Gain
- 400 - 1000 nm and 850 - 1650 nm Wavelength Ranges Available
- SM05 Threaded for Lens Tube and Cage Assembly Integration

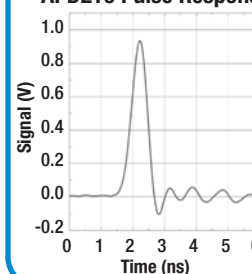
Specifications

	APD210	APD310
Optical Input	Free-Space ^a	Free Space ^a
Supply Voltage	12 - 15 V ^b	12 - 15 V ^b
Current Consumption	200 mA	200 mA
Incident Power (Max)	10 mW	10 mW
Operating Temperature	10 - 40 °C	10 - 40 °C
Spectral Range	400 - 1000 nm	850 - 1650 nm
Detector Diameter	0.5 mm	0.03 mm
Frequency Range	1 - 1600 MHz	1 - 1800 MHz
3 dB Bandwidth	5 - 1000 MHz	5 - 1000 MHz
Rise Time	500 ps	500 ps
Gain Step Size	2500 V/W @ 1 GHz, 800 nm	250 V/W @ 1 GHz, 1500 nm
Gain (Max) ^c	2.5 x 10 ⁵ V/W @ 1 GHz, 800 nm	2.5 x 10 ⁴ V/W @ 1 GHz, 1500 nm
Dark State Noise Level ^d	-80 dBm	-80 dBm
NEP (Calculated)	0.4 pW/ $\sqrt{\text{Hz}}$	2 pW/ $\sqrt{\text{Hz}}$
Output Connectors	BNC	BNC
Output Impedance	50 Ω	50 Ω
Device Dimensions	60 mm x 56 mm x 47.5 mm	60 mm x 56 mm x 47.5 mm
Output Coupling	AC	AC

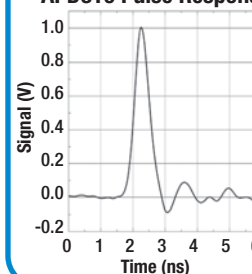
^a With adapter for Thorlabs' SM05 Mount
^c Gain Adjustable via Push Buttons

^b Power Supply included with adapters for EU/USA. Others available upon request.
^d Span: 5 MHz, Resolution Bandwidth 3 kHz

APD210 Pulse Response



APD310 Pulse Response



ITEM #	\$	£	€	RMB	DESCRIPTION
APD210	\$ 2,069.00	£ 1,489.70	€ 1,800.00	¥ 16,489.93	High-Speed Avalanche Detector, 1000 MHz, 400 - 1000 nm
APD310	\$ 2,241.40	£ 1,613.80	€ 1,950.00	¥ 17,863.96	High-Speed Avalanche Detector, 1000 MHz, 850 - 1650 nm

For local and updated pricing, please call Menlo Systems, Inc. in North America 973-300-4490, Menlo Systems GmbH in Europe +49-89-189-1660, or Thorlabs Japan, Inc. in Asia +81-3-5979-8889, or email sales@menlosystems.com.