

# FPD310

## High Sensitivity Fast PIN Photodetector

**MenloSystems**

### KEY SPECIFICATIONS

- Ultrafast Response 1.5 GHz
- Spectral Sensitivity from 400-1000 nm or 950-1650 nm
- 3 dB Bandwidth from 5 MHz -1 GHz
- Extremely short Rise Times below 0.5 ns

### APPLICATIONS

- Detection of Fast Laser Pulses in the Near Infrared or Visible Range
- Detection of Low Light Level Signals
- Radio Frequency and Pulse Shape Extraction of Laser Light Sources
- Heterodyne Laser Beat Signal Detection

### FEATURES

- OEM Integration
- Fiber Coupled or Free Space Optical Input
- Two switchable Gain Settings
- Integrated Low Noise Radio Frequency Amplifier
- Easy-to-use Package
- Low Noise Power Supply included



The high sensitivity ultrafast PIN photodetector FPD310 product family is optimized for high gain, high bandwidths, extremely short rise times and high signal-to-noise ratio. These photodetectors are easy-to-use Si- or InGaAs-PIN photodiode packages with an integrated high gain, low noise RF amplifier.

The gain can be switched between two fixed settings (0 dB and 20 dB attenuation), which allows an optimal performance for the user's application.

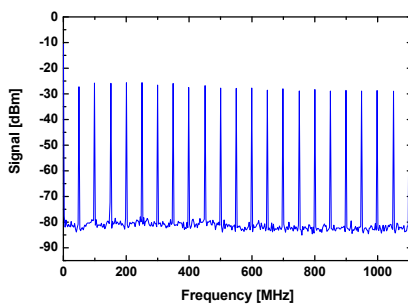
Models for both visible and near infrared range are available, both with either free space or fiber coupled optical input. The compact design of these detectors allows for easy OEM integration. Included with each amplified photodetector is a low noise power supply, which features a universal AC input.

The units are especially recommended for applications like pulse shape and low-noise radio frequency extraction.

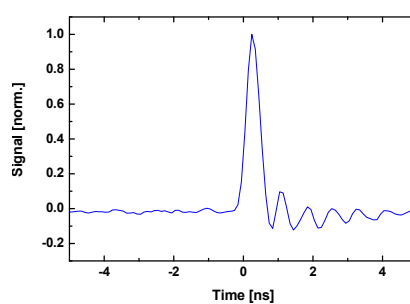
## FPD310

Response to a pulse train with sub 250 fs pulses at 1560 nm and 10  $\mu$ W optical average power:

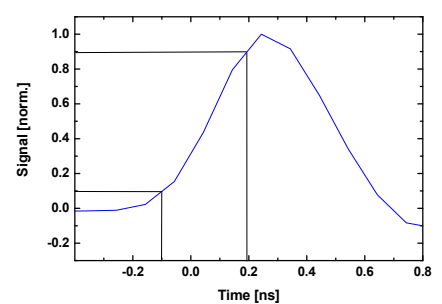
Frequency Characteristics



Time Characteristics



Rise Time



# FPD310

**MenloSystems**  
■■■■■■■■■■

## High Sensitivity Fast PIN Photodetector

### SPECIFICATIONS

FPD310	-FC-VIS	-FS-VIS	-FC-NIR	-FS-NIR
Detector Type	Si	Si	InGaAs	InGaAs
Optical Input	fiber coupled: FC/PC connector	free space	fiber coupled: SMF28 pigtail with FC/APC	free space
Spectral Range	400-1000 nm	400-1000 nm	950-1650 nm	950-1650 nm
Saturation Limit	<200 $\mu$ W	<200 $\mu$ W	<200 $\mu$ W	<200 $\mu$ W
Damage Threshold	2 mW	2 mW	2 mW	2 mW
Detector Diameter	0.25 mm	0.4 mm	-	0.08 mm
Frequency Range	1-1500 MHz	1-1500 MHz	1-1500 MHz	1-1500 MHz
3 dB Bandwidth	5-1000 MHz	5-1000 MHz	5-1000 MHz	5-1000 MHz
Rise Time	0.5 ns	0.5 ns	0.5 ns	0.5 ns
Max. Gain	$2 \times 10^4 V_{\text{Peak-Peak}} / \sqrt{W_{\text{Input}}}$	$2 \times 10^4 V_{\text{Peak-Peak}} / \sqrt{W_{\text{Input}}}$	$2 \times 10^4 V_{\text{Peak-Peak}} / \sqrt{W_{\text{Input}}}$	$2 \times 10^4 V_{\text{Peak-Peak}} / \sqrt{W_{\text{Input}}}$
Dark State Noise Level <small>not integrated</small> (up to 5 MHz / 5-1500 MHz)	-100 dBm $/\sqrt{\text{Hz}}$ -130 dBm $/\sqrt{\text{Hz}}$	-100 dBm $/\sqrt{\text{Hz}}$ -130 dBm $/\sqrt{\text{Hz}}$	-100 dBm $/\sqrt{\text{Hz}}$ -130 dBm $/\sqrt{\text{Hz}}$	-100 dBm $/\sqrt{\text{Hz}}$ -130 dBm $/\sqrt{\text{Hz}}$
NEP (calculated)	25.5 pW $/\sqrt{\text{Hz}}$	24.0 pW $/\sqrt{\text{Hz}}$	12.0 pW $/\sqrt{\text{Hz}}$	14.1 pW $/\sqrt{\text{Hz}}$
Output Impedance	50 $\Omega$	50 $\Omega$	50 $\Omega$	50 $\Omega$
Output Coupling	AC	AC	AC	AC
Output Signal	$\sim 1 V_{\text{pp}}$	$\sim 1 V_{\text{pp}}$	$\sim 1 V_{\text{pp}}$	$\sim 1 V_{\text{pp}}$
Output Connector	SMA female	SMA female	SMA female	SMA female
Supply Voltage	+12 V	+12 V	+12 V	+12 V
Max. Current Consumption	100 mA	100 mA	100 mA	100 mA
Operating Temperature	10-40 $^{\circ}\text{C}$	10-40 $^{\circ}\text{C}$	10-40 $^{\circ}\text{C}$	10-40 $^{\circ}\text{C}$
Storage Temperature	-20 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$	-20 to +85 $^{\circ}\text{C}$	-20 to +85 $^{\circ}\text{C}$	-20 to +85 $^{\circ}\text{C}$
Storage Humidity (RH= relativ humidity)	10-90 % RH	10-90 % RH	10-90 % RH	10-90 % RH
Device Dimensions	60 x 50 x 20 mm <sup>3</sup>	60 x 50 x 20 mm <sup>3</sup>	60 x 50 x 20 mm <sup>3</sup>	60 x 50 x 20 mm <sup>3</sup>

### ORDERING INFORMATION

Product Code	FPD310-FC-VIS	FPD310-FS-VIS	FPD310-FC-NIR	FPD310-FS-NIR
Price	1860 EUR	1860 EUR	1860 EUR	1860 EUR

Prices and specifications are subject to change without notice. Custom modifications are available, please inquire.

**MenloSystems**  
■■■■■■■■■■

**Menlo Systems GmbH**  
T+49 89 189 166 0  
sales@menlosystems.com

**Menlo Systems, Inc.**  
T+1 973 300 4490  
ussales@menlosystems.com

**Thorlabs, Inc.**  
T+1 973 579 7227  
sales@thorlabs.com

