

# FPD510

## High Sensitivity Fast PIN Photodetector

**MenloSystems**



### KEY SPECIFICATIONS

- Frequency Range DC-250 MHz
- Spectral Sensitivity from 400-1000 nm or 950-1650 nm
- 3 dB Bandwidth DC-200 MHz
- Rise Time below 2 ns

### APPLICATIONS

- Efficient Homodyne and Heterodyne Extraction of Optical Beat Signals at Frequencies up to 250 MHz
- Detection of Low Light Level Signals
- Characterization of Pulsed or Modulated Light Sources Features
- Detection of Chopped Light Sources

### FEATURES

- Highest Signal-to-Noise Ratio with true DC
- Flat Spectral Response (less than 3 dB up to 200 MHz)
- OEM Integration
- Fiber Coupled or Free Space Optical Input
- Integrated Low Noise Transimpedance Amplifier
- Easy-to-use Package
- Low Noise Power Supply included

The high sensitivity ultrafast PIN photodetector FPD510 product family is optimized for highest signal-to-noise-ratio for detection of low level optical beat signals and pulse shape at frequencies up to 250 MHz.

These photodetectors are easy-to-use Si- or InGaAs-PIN photodiode packages with an integrated high-gain, low-noise transimpedance amplifier.

The 3 dB bandwidth of the DC-coupled device is 200 MHz.

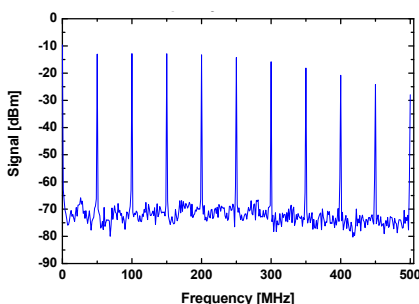
Models for both visible and near infrared range are available, both with either free space or fiber coupled optical input. The compact design of these detectors allows for easy OEM integration. Included with each amplified photodetector is a low noise power supply, which features a universal AC input.

The units are especially recommended for applications e.g. in metrology and optical lock techniques when homodyne or heterodyne optical beat signals of weak power have to be detected and amplified in a highly efficient way.

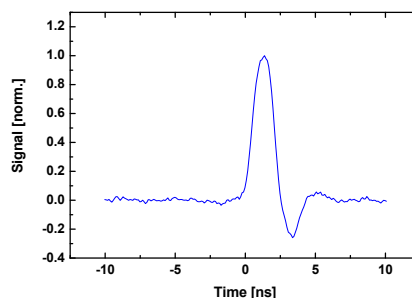
## FPD510

Response to a pulse train with sub 250 fs pulses at 1560 nm and 5  $\mu$ W optical average power:

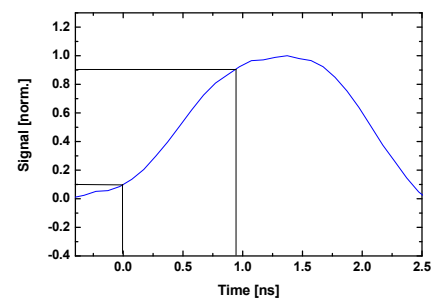
Frequency Characteristics



Time Characteristics



Rise Time



# FPD510



## High Sensitivity Fast PIN Photodetector

### SPECIFICATIONS

FPD510	-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	<100 µW	<100 µW	<100 µW	<100 µW
Damage Threshold	3 mW	3 mW	3 mW	3 mW
Detector Diameter	0.25 mm	0.4 mm	-	0.3 mm
Frequency Range	DC-250 MHz	DC-250 MHz	DC-250 MHz	DC-250 MHz
3 dB Bandwidth	DC-200 MHz	DC-200 MHz	DC-200 MHz	DC-200 MHz
Rise Time	2 ns	2 ns	2 ns	2 ns
Max. Gain	$1.5 \times 10^5 V_{\text{Peak-Peak}}/\sqrt{W}_{\text{Input}}$	$1.5 \times 10^5 V_{\text{Peak-Peak}}/\sqrt{W}_{\text{Input}}$	$1.5 \times 10^5 V_{\text{Peak-Peak}}/\sqrt{W}_{\text{Input}}$	$1.5 \times 10^5 V_{\text{Peak-Peak}}/\sqrt{W}_{\text{Input}}$
Dark State Noise Level <small>not integrated</small> (up to 5 MHz / 5-250 MHz)	-110 dBm / $\sqrt{\text{Hz}}$ / -135 dBm / $\sqrt{\text{Hz}}$	-110 dBm / $\sqrt{\text{Hz}}$ / -135 dBm / $\sqrt{\text{Hz}}$	-110 dBm / $\sqrt{\text{Hz}}$ / -135 dBm / $\sqrt{\text{Hz}}$	-110 dBm / $\sqrt{\text{Hz}}$ / -135 dBm / $\sqrt{\text{Hz}}$
NEP (calculated)	6.4 pW/ $\sqrt{\text{Hz}}$	6.0 pW/ $\sqrt{\text{Hz}}$	3.0 pW/ $\sqrt{\text{Hz}}$	3.2 pW/ $\sqrt{\text{Hz}}$
Output Impedance	50 Ω	50 Ω	50 Ω	50 Ω
Output Coupling	DC	DC	DC	DC
Output Signal	0-1 V	0-1 V	0-1 V	0-1 V
Output Connector	SMA female	SMA female	SMA female	SMA female
Supply Voltage	+12 V    -12 V	+12 V    -12 V	+12 V    -12 V	+12 V    -12 V
Max. Current Consumption	50 mA    20 mA	50 mA    20 mA	50 mA    20 mA	50 mA    20 mA
Operating Temperature	10-40 °C	10-40 °C	10-40 °C	10-40 °C
Storage Temperature	-20 to +85 °C	-20 to +85 °C	-20 to +85 °C	-20 to +85 °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	FPD510-FC-VIS	FPD510-FS-VIS	FPD510-FC-NIR	FPD510-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.



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