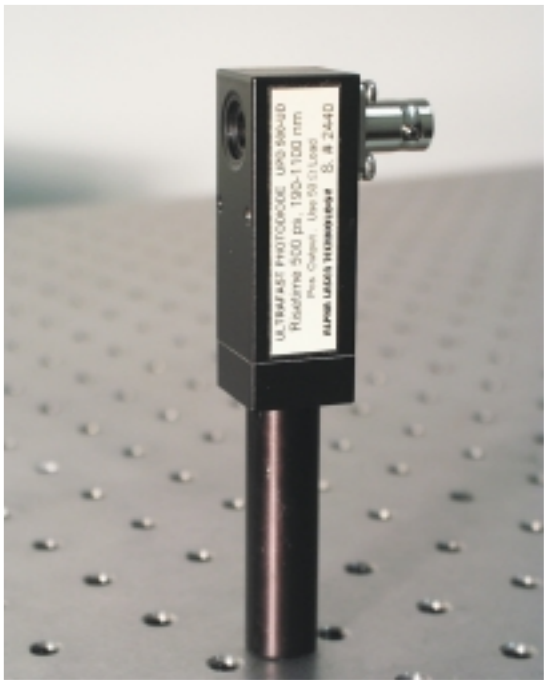
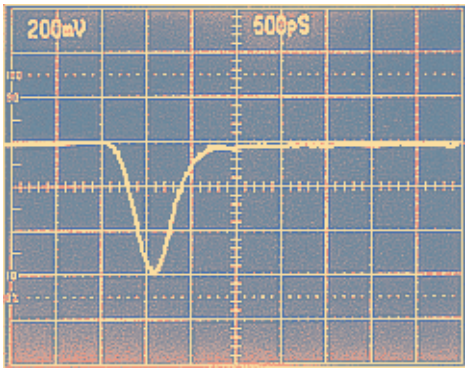
ALPHALAS GmbH

ULTRAFAST PHOTODETECTORS UPD



FEATURES:

- ultra high-speed operation
- risetime below 40 picoseconds
- wide spectral ranges
- built-in biasing
- long-life battery
- coaxial photodiode coupling
- compact design
- high sensitivity



APPLICATIONS:

- pulse form measurements
- pulse duration measurements
- precise synchronization

AN EXAMPLE OF A 10-PS LASER PULSE MEASURED BY UPD-200-SD PHOTODIODE AND 1 GHz OSCILLOSCOPE. THE MEASURED PULSE DURATION IS LIMITED BY THE OSCILLOSCOPE BANDWIDTH.

AVAILABLE TYPES:

PHOTODETECTOR	RISE TIME	QUANTUM EFFICIENCY	SENSITIVE AREA
UPD-200	<200 ps	45 %	0.1 mm^2
UPD-300	300 ps	80 %	0.25 mm^2
UPD-500	500 ps	80 %	1.0 mm^2
UPD-300 IR1	300 ps	75 %	0.008 mm^2
UPD-70 IR2*	70 ps	90 %	0.005 mm^2
UPD-40 IR2*	<40 ps	90 %	0.003 mm^2

Spectral ranges: 320-1100 nm (index **S, Silicon**), 190-1100 nm (index **U, UV-enhanced Silicon**)
700-1800 (index **IR1, Germanium**), 800-1700 (index **IR2, InGaAs**)

Window type: polished (index **P**) or diffuse (index **D**)

Dimensions: Housing: 20x20x60 mm + **BNC-connector/*SMA-connector**

--- ORDERING INFORMATION AND A PRACTICAL HINT ON THE NEXT PAGE ---

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The ultrafast PIN photodiodes have certain advantages over vacuum photodiodes. Besides the compact size and low-voltage power supply, they feature higher sensitivity, which is typically two orders of magnitude larger in the near infrared as compared to vacuum photodiodes.
Our UV-extended version is the only commercial photodiode that covers the spectral range from 190 nm to 1100 nm and has risetime below 200 ps. **Because of the extremely low dark current, the built-in high-power battery provides trouble-free operation for UP TO FIVE YEARS*! In combination with our ultrafast low-noise amplifiers (1 GHz bandwidth) the UPD-type photodetectors are an inexpensive alternative to the avalanche devices.**
** UPD-300-IR, UPD-500 and monitoring of lasers with repetition rate >100 Hz require external power supply!*

ORDERING INFORMATION:

UPD - XXX - X X - X

- UPD: Ultrafast photo detector
- XXX: Rise time (picoseconds)
- X: Spectral range: S=visible, U=Uv, IR=Infrared
- X: Window type: P=Polished, D=Diffusor
- X: H=High rep. rate >100 Hz, L=Low rep. rate <100 Hz

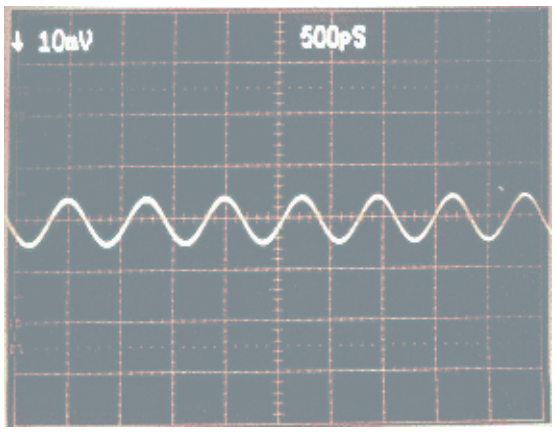
EXAMPLE: UPD-200-UD-L

ultrafast photodetector with 200 ps rise time,
spectral range extended to UV, with diffusor,
for low rep. rate laser pulses < 100 Hz

A PRACTICAL HINT!

In order to evaluate the performance of a high-speed photodetector, you do not need a short pulse laser source at all. Just take a small He-Ne laser and focus the light on the sensitive area of the PIN photodiode. You will observe a signal modulated with very high frequency due to the *longitudinal mode beating*. In the figure on the right, the beating frequency f=c/2L (c -speed of light, L - laser cavity length) is 1.5 Gigahertz! Since this frequency is well above the specified 1 GHz oscilloscope bandwidth, the modulation depth in the figure is 25% only.

LONGITUDINAL MODE BEATING OF A He-Ne LASER AS DETECTED BY UPD-200-SP PHOTODIODE



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