

Ultrafast Photodetectors

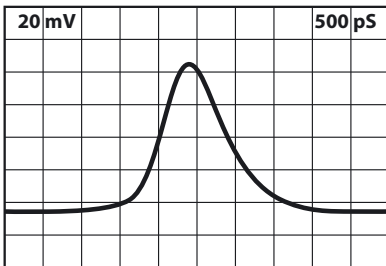
UPD Series



The UPD series of ultrafast photodetectors are best suited for measuring of optical waveforms from DC to 10 GHz. Various models feature rise times from 30 to 500 ps and cover the spectral range from 170 to 1700 nm.

All photodetectors are enclosed in compact and solid aluminum housings and can be biased with a battery or an external power supply.

The UV-extended versions of the silicon type photodetectors are the only commercial products that cover the spectral range from 170 to 1100 nm.



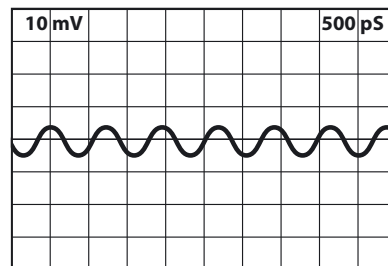
High fidelity pulse form measurement with UPD-200-SP and 1 GHz oscilloscope. The light source is our PULSELAS®-P-1064-100 subnanosecond Q-switched laser.

Another type of unique UV-sensitive InGaAs photodetectors can be used for detecting laser pulses in the range from 250 to 1700 nm, thus having the widest spectral range and the highest speed commercially available.

Perfect impedance matching and state-of-the-art microwave technology assure pulse form measurements without any ringing or artefacts. The customer is free to use a 50 Ω terminating resistor for highest speed operation, or a high impedance load for obtaining large signals. This guarantees maximum flexibility for diverse applications.

In combination with our BBA series of wideband high-gain amplifiers, the high-speed photodetectors are an advantageous alternative to the expensive avalanche photodiodes.

The UPD series high-speed photodetectors are indispensable tools for laser and photonics research.



Longitudinal mode beating of a He-Ne laser (633 nm) recorded with UPD-200-SP photodetector and 1 GHz oscilloscope. The modulation depth of the 1.5 GHz beating signal is limited to 25% by the oscilloscope bandwidth.

Features

- Ultra High-Speed Operation
- Rise Times: 30 - 500 ps
- Bandwidths: up to 10 GHz
- Spectral Ranges: 170 - 1700 nm
- Compact Design
- Battery or External Power Supply

Applications

- Pulse Form Measurements
- Pulse Duration Measurements
- Precise Synchronization
- Mode Beating Monitoring
- Heterodyne Measurements

Related Products

- Broadband Amplifiers BBA Series (amplitude gain: $\times 10$, $\times 100$ or variable $\times 1 \div 100$)
- BNC 50 Ω Terminating Load
- SMA (male) to BNC (female) Adapter
- SMA to SMA Adapter
- Attenuator Filter Adapter

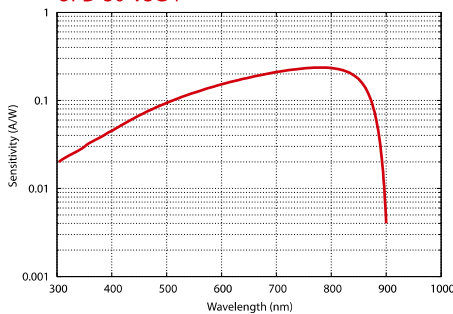
UPD Series • Available Models

Model	Rise Time (ps)	Bandwidth (GHz)	Spectral Range (nm)	Quantum Efficiency	Sensitive Area (mm ²)	Noise Eq. Power (W/√Hz)	Dark Current (nA)	Material	Window Type ¹⁾	Connector Type
UPD-30-VSG-P	< 30	> 10	320 - 900	40%	0.04	3.0 · 10 ⁻¹⁵	0.1	GaAs	polished, glass	SMA
UPD-40-VSI-P	< 40	> 7.5	500 - 1690	60%	0.04	2.0 · 10 ⁻¹⁰	5000	InGaAs	polished, glass	SMA
UPD-40-IR2-D	< 40	> 7.5	800 - 1700	65%	0.003	1.0 · 10 ⁻¹⁵	0.3	InGaAs	diffuse, quartz	SMA
UPD-40-UVIR-D	< 40	> 7.5	350 - 1700	65%	0.003	1.1 · 10 ⁻¹⁵	0.32	InGaAs	diffuse, quartz	SMA
UPD-40-UVIR-P	< 40	> 7.5	350 - 1700	65%	0.003	1.1 · 10 ⁻¹⁵	0.32	InGaAs	polished, MgF ₂	SMA
UPD-70-IR2-P	< 70	> 4.5	800 - 1700	90%	0.005	1.0 · 10 ⁻¹⁵	0.3	InGaAs	polished, glass	BNC
UPD-70-UVIR-D	< 70	> 4.5	350 - 1700	90%	0.005	1.1 · 10 ⁻¹⁵	0.32	InGaAs	diffuse, quartz	BNC
UPD-70-UVIR-P	< 70	> 4.5	350 - 1700	90%	0.005	1.1 · 10 ⁻¹⁵	0.32	InGaAs	polished, MgF ₂	BNC
UPD-200-SP	< 175	> 2.0	320 - 1100	45%	0.1	1.5 · 10 ⁻¹⁵	0.001	Si	polished, glass	BNC
UPD-200-UD	< 175	> 2.0	170 - 1100	45%	0.1	1.5 · 10 ⁻¹⁵	0.001	Si	diffuse, quartz	BNC
UPD-200-UP	< 175	> 2.0	170 - 1100	45%	0.1	1.5 · 10 ⁻¹⁵	0.001	Si	polished, MgF ₂	BNC
UPD-300-SP	< 300	> 1.0	320 - 1100	80%	0.25	3.0 · 10 ⁻¹⁵	0.005	Si	polished, glass	BNC
UPD-300-UD	< 300	> 1.0	170 - 1100	80%	0.25	3.0 · 10 ⁻¹⁵	0.005	Si	diffuse, quartz	BNC
UPD-300-UP	< 300	> 1.0	170 - 1100	80%	0.25	3.0 · 10 ⁻¹⁵	0.005	Si	polished, MgF ₂	BNC
UPD-500-SP	< 500	> 0.6	320 - 1100	80%	1.0	3.6 · 10 ⁻¹⁵	0.01	Si	polished, glass	BNC
UPD-500-UD	< 500	> 0.6	170 - 1100	80%	1.0	3.6 · 10 ⁻¹⁵	0.01	Si	diffuse, quartz	BNC
UPD-500-UP	< 500	> 0.6	170 - 1100	80%	1.0	3.6 · 10 ⁻¹⁵	0.01	Si	polished, MgF ₂	BNC

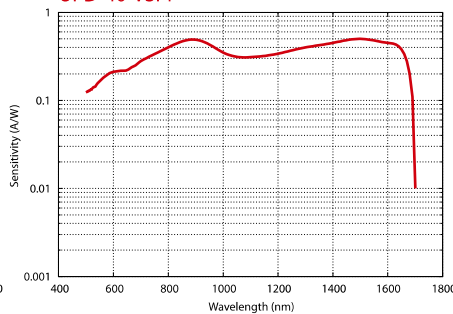
Note:

¹⁾ The diffuse window reduces the positioning accuracy requirements and increases the damage threshold at the cost of a reduced sensitivity by a factor of approximately three. Recommended for high peak power lasers.

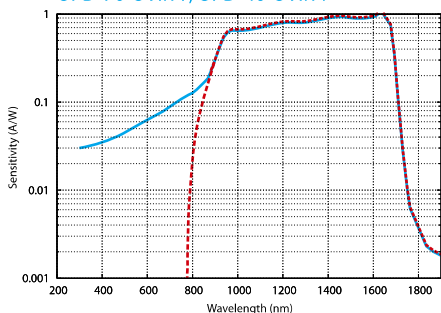
Spectral Response GaAs Schottky Ultrafast Photodetector
UPD-30-VSG-P



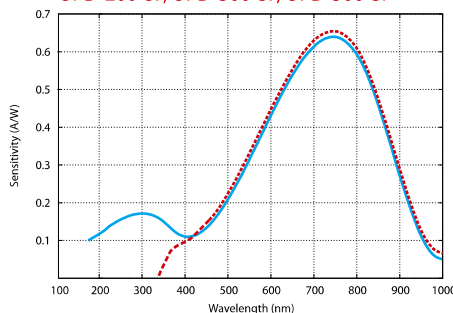
Spectral Response InGaAs Schottky Ultrafast Photodetector
UPD-40-VSI-P



Spectral Response InGaAs Ultrafast Photodetectors
UPD-70-IR2-P, UPD-40-IR2-P
UPD-70-UVIR-P, UPD-40-UVIR-P



Spectral Response Si-PIN Ultrafast Photodetectors
UPD-200-UP, UPD-300-UP, UPD-500-UP
UPD-200-SP, UPD-300-SP, UPD-500-SP



Power Sources for UPD Series

Model	Description
PS-UPD-12-EU	Low-Noise Power Supply Input: 230 V AC (European standard) Output: 12 V DC
PS-UPD-12-WW	Low-Noise Power Supply Input: 100 - 240 V AC (for worldwide usage) Output: 12 V DC
BAT-UPD-6V	Bias Battery, 6 V

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