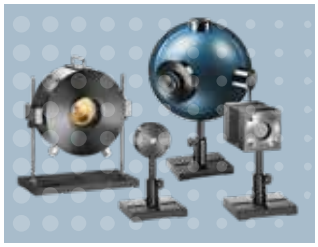
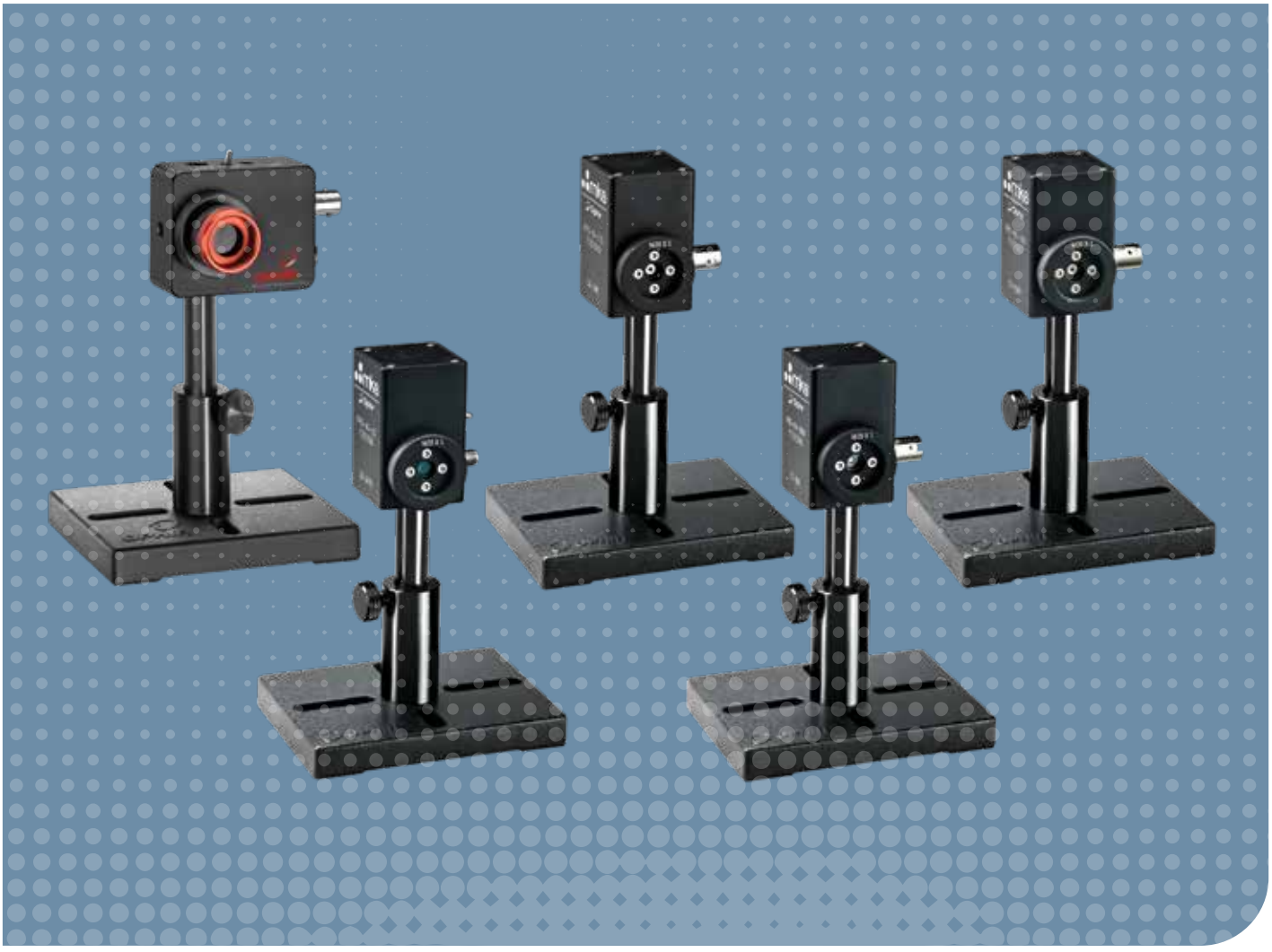
2026 PULSE CHARACTERIZATION SENSORS 1.3

SENSORS





1.3 Pulse Characterization Sensors

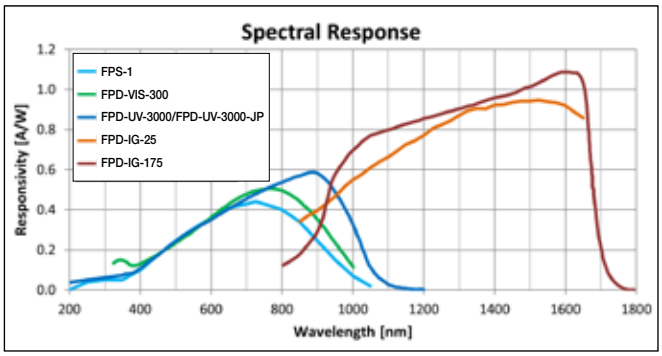
Introduction

Ophir's high speed, biased PIN **Fast Photodiode Detectors (FPD series)** convert fast optical pulses into electrical signals. When terminated into 50Ω into an oscilloscope or spectrum analyzer, the temporal characteristics of lasers pulses can be viewed and measured. A selection of models covers the spectrum from 190nm to 1700nm and a range of rise times and sensitivities. The photodiode bias voltage is supplied by internal batteries and/or external power supply depending on the model. Ophir's Pulse Characterization Sensors do not require calibration.

In order to achieve minimal response times, the photodiodes used in these detectors are relatively small. This reduces their capacitance and increases their electrical bandwidth. This makes them ideal for sampling a portion of the laser beam by placing them directly in the beam path or by picking up reflections bouncing off a nearby target.

When it is important to capture the entire beam, the temporal sensor can be attached to an integrating sphere. The laser beam enters the integrating sphere, and the temporal detector attached at the side will sample a small portion of the laser beam's energy which is scattered inside the sphere. When additional amplification of the detected signal is needed, for example, in order to feed the detected signal into a digital acquisition system, a trans-impedance amplifier should be used. For best performance a trans-impedance amplifier with 50Ω input resistance and bandwidth equal to or larger than that of the sensor should be used.

Accessories available include attenuators, fiber optic adapters and adapters for attaching to integrating spheres.



Related Product

For an FPD detector built into an integrating sphere sensor, see our **IS1.5-VIS-FPD-800, 1.5" High Speed Response, Multi-functional Integrating Sphere on page 38.**

IS1.5-VIS-FPD-800 (see p. 38)

1.3.1 Fast Photodiode Detectors (FPD)

Features

- Fast response time down to 25 psec
- Measure temporal pulse shape
- Spectral coverage from 193 to 1700 nm
- Optional attenuators, fiber optic adapters and integrating sphere adapters available

Description

Ophir's high speed, biased PIN photodiode detectors convert fast optical pulses into electrical signals. When terminated into 50Ω into an oscilloscope or spectrum analyzer, the temporal characteristics of lasers can be viewed and measured. A selection of models covers the spectrum from 190nm to 1700nm and a range of rise times and sensitivities. The photodiode bias voltage is supplied by internal batteries and/or external power supply depending on the model. Ophir's Pulse Characterization Sensors do not require calibration.

Accessories available include attenuators, fiber optic adapters and adapters for attaching to integrating spheres.

For an FPD detector built into an integrating sphere sensor, see our IS1.5-VIS-FPD-800, 1.5" High Speed Response, Multi-functional Integrating Sphere on page 38.

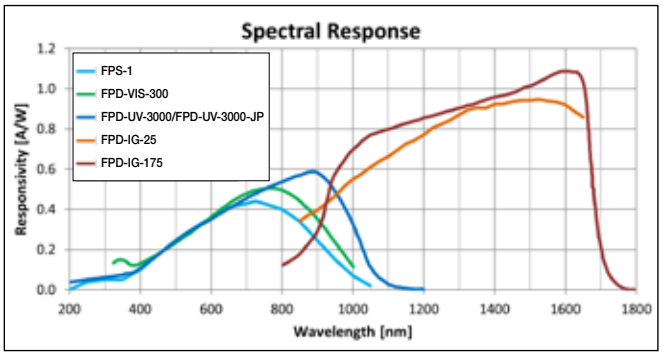
Model [a]	FPS-1	FPD-UV-3000 / FPD-UV-3000-JP [d]	FPD-VIS-300	FPD-IG-175	FPD-IG-25
Detector Type	UV-Si	UV-Si	Si	InGaAs	InGaAs
Rise Time/Fall Time nsec	1.5	3	<0.3	<0.175	<0.025
Spectral Range nm (see graph on next page)	193-1100	193-1100	320-1100	900-1700	900-1700
Active Area Diameter mm	1.02	2.55	0.4	0.1	0.032
Detector Area mm^2	0.8	5.11	0.13	0.0079	0.00080
Wavelength of Peak Sensitivity nm	720	890	770	1600	1500
Responsivity at Peak Wavelength A/W	0.45	0.58	0.5	1.1	0.95
Responsivity (Irradiance) at Peak Wavelength $V/(W/cm^2)$	0.18	1.5	31×10^{-3}	4.3×10^{-3}	0.19×10^{-3}
Bias Voltage VDC	12	24	9	6	6
Bias Voltage Source	External or Battery	External	Batteries	Batteries	Batteries
Bandwidth	233 MHz	>118 MHz	>1.2 GHz	>2 GHz	>15 GHz
Dark Current nA	0.3 typ, 1.0 max	<10	<0.1	<2	<3
Noise Equivalent Power [b] $pW/\sqrt{Hz}$	0.05	<0.10	<0.01	<0.03	20
Maximum Average Power Input [b], [c] mW	3	15	25	10	10
Mounting (Tapped Holes)	1/4-20	8-32 & M4	8-32 & M4	8-32 & M4	8-32 & M4
Output Connector	BNC	BNC	BNC	BNC	SMA
Accessory Threads	SM-1	M20x1	M20x1	M20x1	M20x1
Version					
Compliance	CE, UKCA, China RoHS	CE, UKCA, China RoHS	CE, UKCA, China RoHS	CE, UKCA, China RoHS	CE, UKCA, China RoHS
Part Number	**7Z02505**	**7Z02506 / 7Z07153**	**7Z02507**	**7Z02509**	**7Z02508**

Note: (a) All specs are with 50 ohm load
Note: (b) At wavelength of peak sensitivity
Note: (c) Maximum peak power is twice the average power for 10 nsec pulses
Note: (d) The FPD-UV-3000-JP is sold exclusively in Japan

* For drawings please see page 152

Fiber Adapters [d] - see page 35				ND Attenuators [d]		IS6 Integrating Sphere Adapters - see page 42	
SC type	ST type	FC type	SMA type	ND1 nom. X10 attenuator	ND2 nom. X50 attenuator	For FPD	For FPS-1
7Z08227	7Z08226	7Z08229	1G01236A	7Z08200	7Z08201	7Z08350	7Z08289

Note: (d) FPS-1 sensor requires also a SM1 to M20 mounting bracket adapter P/N 1G02259

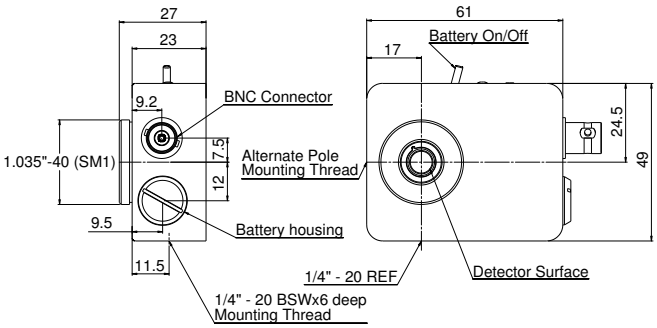


FPD detector mounted on IS6

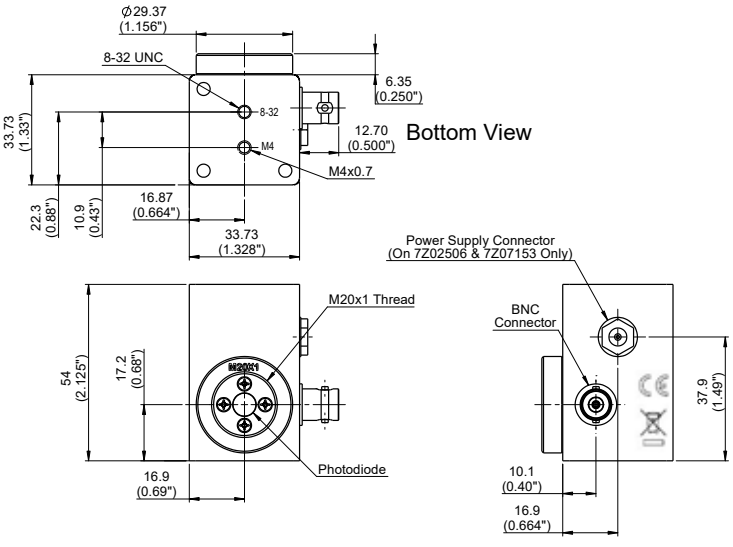
ND Attenuators

Related Product
IS1.5-VIS-FPD-800
Integrating Sphere with built in FPD Detector (see p. 38)

FPS-1



FPD-UV-3000 / FPD-UV-3000-JP / FPD-VIS-300 / FPD-IG-175



FPD-IG-25