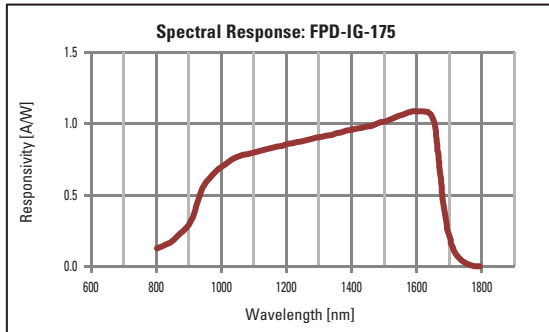


6. Spectral Response

A graph of the approximate relative spectral response of the FPD-IG-175 is given below. This graph represents the sensitivity without the additional filters.



Ophir®

FPD-IG-175

Fast Photodiode Detector
for Temporal Measurements

1 General Description

The FPD-IG-175 is a fast indium gallium arsenide photodiode detector for the NIR spectrum designed to work with oscilloscopes and spectrum analyzers for measuring the temporal characteristics of pulsed lasers. Its rise and fall times are <175 picoseconds.

Optional input accessories provide for connecting optical fibers or IS6 integrating spheres to the device's input. Optional filter accessories enable attenuation of the optical input signal.

All FPD detectors come with a stand and base. A nylon standoff is included to allow for electrically insulating the detector from the stand. This can be used in the event that electrical noise is introduced through the base.

1. Getting Started

Connections:

The FPD-IG-175 operates from internal batteries. Connect the output BNC to your oscilloscope or spectrum analyzer via an input with 50Ω termination resistance. The coax cable used should have an impedance of 50Ω and its length should preferably be 1 m or less. Note: In order to avoid premature battery drainage, the output cable should be disconnected from battery operated detectors when not in use.



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FPD-IG-175 Quick Reference

2. Power vs. Time Measurement

The peak power of nanosecond pulses is usually very high and above the saturation level of the FPD-IG-175. However, it is not necessary to have the laser beam incident directly on the detector to measure properly. The beam can be scattered from a diffusive white surface and the FPD-IG-175 can be placed facing the same surface at a distance from it so that the detector receives only a small fraction of the total power. The distance from the scattering surface to the FPD-IG-175 can be varied to get a good, but not saturated signal. If the intensity is still too high, or it is not convenient to measure scattered light, attenuating filters are available to reduce the laser intensity. See ordering information in section 5.

Measuring pulsed lasers with the FPD-IG-175:

1. Verify that the batteries are in good condition.
2. Make sure the BNC cable is terminated with a 50Ω impedance.
3. Start with diffusing the laser beam off of a diffusive white surface and placing the FPD-IG-175 at a distance of ~20cm from the surface. If the peak intensity is still too high, move the FPD-IG-175 further away and/or rotate it so that it faces the diffusing surface at an angle. If the intensity is still too high, one or more filters are recommended (see ordering information in section 5). If the intensity is too low, move the sensor closer to the laser spot.
4. If you are measuring a laser pulse through a fiber and are using the optional fiber adapter, first try measuring the beam with several filters in and remove them as necessary.
5. If using the FPD-IG-175 with an IS6 integrating sphere, attenuating filters can be used to lower the signal level.

3. Battery Replacement

In order to conserve battery charge, disconnect the output cable whenever the FPD-IG-175 is not in use.

The batteries can be accessed for testing and replacement by removing the 4 screws at the top of the units to open the top plate. Batteries are to be inserted with the positive terminal down.

4. Maintenance

The detector probe should be periodically cleaned with tissue and alcohol. Otherwise no other care is needed for the instrument.

5. Specifications

| | | |
|--|--|----------|
| Model | FPD-IG-175 | |
| P/N | 7Z02509 | |
| Detector | InGaAs photodiode | |
| Spectral range | 900 nm – 1700 nm | |
| Detector area | 0.0079 mm ² | |
| Spectral response | See graph in section 6 | |
| Performance specifications | Into 50Ω load | |
| Risetime 0 – 90% | <175 ps | |
| Sensitivity at peak wavelength | 4.3 mV for 1W/cm ² input | |
| Maximum average output voltage | 0.55 V | |
| Output connection | BNC | |
| Power | 6V (CR2430 battery x2) | |
| Input | Direct or scattered laser light or from fiber optics | |
| Input thread | M20 x 1 thread | |
| Optional attenuators and fiber adapters (M20 thread) | Description | P/N |
| | IS6 adapter | 7Z08350 |
| | X10 nom. attenuator | 7Z08200 |
| | X50 nom. attenuator | 7Z08201 |
| | SMA fiber adapter | 1G01236A |
| | FC, FC/APC fiber adapter | 7Z08229 |
| | ST fiber adapter | 7Z08226 |
| SC fiber adapter | 7Z08227 | |