Fiber Coupled High-Speed InGaAs PIN Photodiode

(all fiber types, SM, PM, MM, 900 to 1600nm,, high speed up to 0.3ns)

DATASHEET

Return to the Webpage



The Fiber-Coupled High-Speed InGaAs PIN Photodiode features a unique compact package designed for high-speed operation with fast rise and fall times. The component directly integrates an optical fiber with a high-sensitivity InGaAs photodiode for optical signal detection. The detector provides an analog electrical output without an integrated transimpedance amplifier (TIA). The optimized design minimizes assembly cost and package footprint while providing excellent stability over wide temperature and wavelength ranges. Three bandwidth options are available: 200 MHz, 2.5 GHz, and 5 GHz. The photodetector active-area size is optimized according to the required response speed. Lower-speed versions use a larger detector area, providing higher optical coupling efficiency and easier fiber alignment, while higher-speed versions use a smaller detector area to reduce capacitance and achieve faster response. The overall frequency response depends on the external amplifier and RF circuit design. For bandwidths up to approximately 3 GHz, a matched amplifier/driver is available. For customers without expertise in high-frequency amplifier design, we also offer a turnkey module solution that consists of an integrated TIA , fan-out RF connector, and optimized high-frequency electronics.

Due to their high sensitivity to electrostatic discharge (ESD), these photodetectors require careful handling. Warranty coverage is provided only for fully metal-enclosed modules and benchtop units that incorporate appropriate ESD protection. Component-level and other unprotected versions of the lasers and photodetectors are not covered by warranty. These devices should therefore be handled and operated with appropriate ESD precautions.

Applications

- Channel Monitoring
- Power Monitoring in Optical
- Interface Modules
- Gain Monitoring for Amplifier
- Instruments

Features

- Low Cost
- Large Bandwidth
- ns Fast Response
- High Reliability

Specifications

Parameter	Min	Typical	Max	Unit
Central Wavelength	900		1600	nm
Responsivity [1]	0.7	0.9		A/W
Input Power	–45		17	dBm
PDL [2]		0.03	0.05	dB
Polarization extinction ratio [3]	18	23		dB
Dark Current at 23°C		0.4	1.0	nA
Capacitance		0.2	0.9	pF
Reverse Voltage			5	V
Response Frequency	DC	2.5	5	GHz
Operating Temperature	–40		+75	°C
Storage Temperature	–40		+85	°C
Reliability	Telcordia 1209 and 1221			

Notes:

[1]. The net responsivity is defined as the ratio of the PD current output and optical power measured at output fiber

[2]. Single Mode Fiber version only.

[3]. PM Fiber version only.

[4]. Directivity defines the responsivity contrast between the case that light power comes from input fiber port and the case that light power comes from output fiber port. From 1260 to 1620nm.

Note: The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link]:

Warning: **The device is extremely ESD-sensitive. Its dark current increases by unprotected handling. It is recommended to be handled under a certified ion fan once the package is removed.**

RoHS COMPLIANT

Legal notices: All product information is believed to be accurate and is subject to change without notice. Information contained herein shall legally bind Agiltron only if it is specifically incorporated into the terms and conditions of a sales agreement. Some specific combinations of options may not be available. The user assumes all risks and liability whatsoever in connection with the use of a product or its application.

Rev 09/18/26

P +1 781-935-1200 E sales@agiltron.com W www.agiltron.com

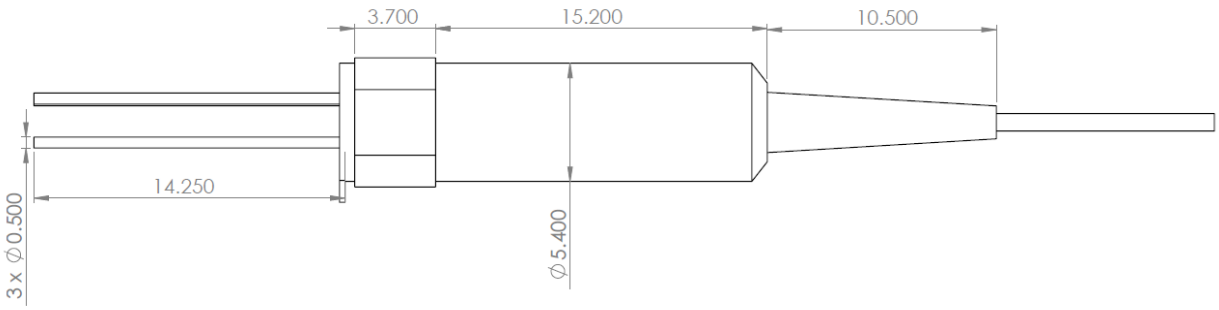
Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

Fiber Coupled High-Speed InGaAs PIN Photodiode

(all fiber types, SM, PM, MM, 900 to 1600nm,, high speed up to 0.3ns)

DATASHEET

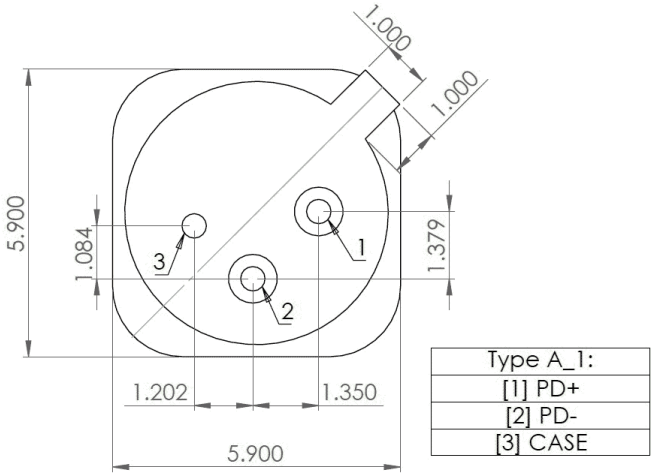
Mechanical Footprint Dimensions (mm)



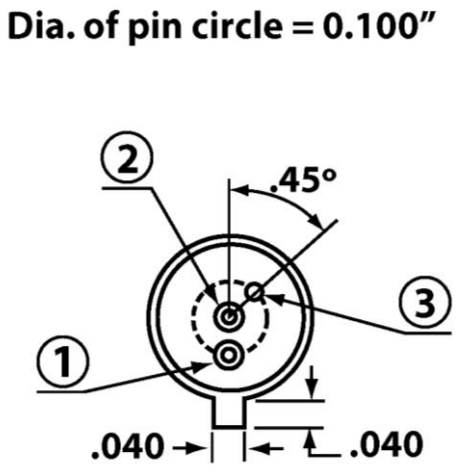
Standard Package for Infrared Band. For other wavelength band, size may vary due to special detector configurations.

*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

PD PIN Assignments



Package Type 1



Package Type 2

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

Fiber Coupled High-Speed InGaAs PIN Photodiode

(all fiber types, SM, PM, MM, 900 to 1600nm,, high speed up to 0.3ns)

DATASHEET

Ordering Information (Part Number)

	1	☐	☐	☐☐	☐	☐	☐	☐
Prefix	**Wavelength**	**Speed**	**Package**	**Fiber Type**	**Fiber Cover**	**Fiber Length**	**Connector [1][2]**	**Driver [3]**
FCHI-	800 - 1600 = 1 Special = 0	0.2GHz = 8 2.5Ghz = 2 5GHz = 5 5MHz = 6	Type 2 = 2 Type 1 = 1	***Choose from the table below***	White 0.9mm tube = 3 Red 0.9mm tube = 3 Black 0.9mm tube = 3 Bare fiber = 1 Special = 0	0.25m = 1 0.5m = 2 1.0 m = 3 1.5 m = 5 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7 LC/APC = A LC/UPC = U Special = 0	Non = N PCB = P Benchtop = B

[1]. Regular fiber connector has PER ~22dB. Connector with PER >27 dB is available using special process.

[2]. The default connector configuration uses fiber with 0.9 mm buffer protection. The connector cannot be installed directly onto bare fiber because the bare fiber is prone to damage during shipping. However, the connector can be assembled on bare fiber if a 3 cm protective loose tube is added for reinforcement. The customer may remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SMF-28 fiber and decreases further for smaller-core fibers.
The default PM fiber connector is **2.0 mm narrow key, with the fiber slow axis aligned to the key**.

[3]. DC–1GHz Driver $450

Fiber Type Selection Table:

01	**SMF-28**	34	**PM1550**	71	**MM 50/125µm**
02	**SMF-28e**	35	**PM1950**	72	**MM 62.5µm**
03	**Corning XB**	36	**PM1310**	73	**105/125µm**
04	**SM450**	37	**PM400**	74	**FG105LCA**
05	**SM1950**	38	**PM480**	75	**FG50LGA**
06	**SM600**	39	**PM630**	76	**STP 50/125**
07	**Hi780**	40	**PM850**	77	**200µm**
08	**SM800**	41	**PM980**	78	**400µm**
09	**SM980**	42	**PM780**	79	**800µm**
10	**Hi1060**	43	**PM350**		
11	**SM400**	44	**PM405**		
12		45	**PM460**		
13		46			

Application Notes

Fiber Core Alignment
Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness
Fibers with smaller core diameters (<5 µm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power
Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the how handling by expanding the core side at the fiber ends.

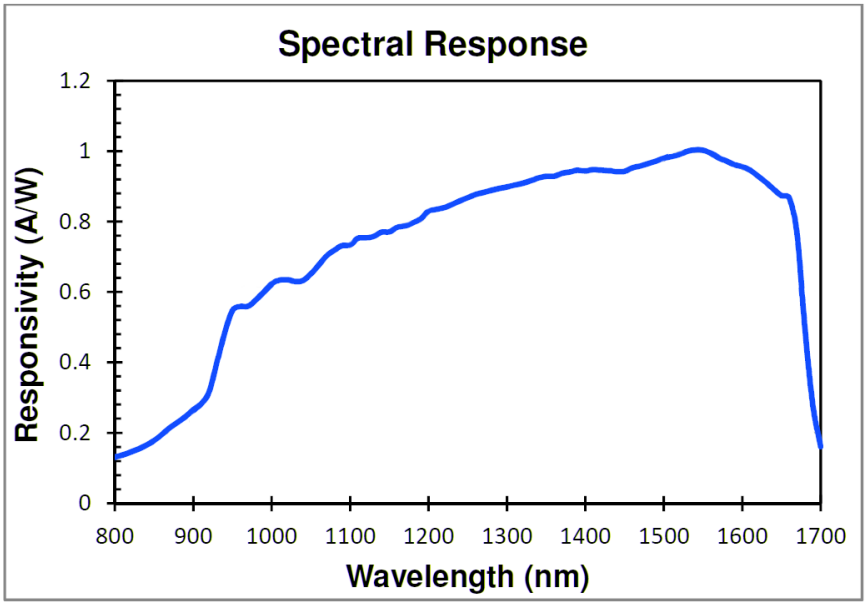
Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

Fiber Coupled High-Speed InGaAs PIN Photodiode

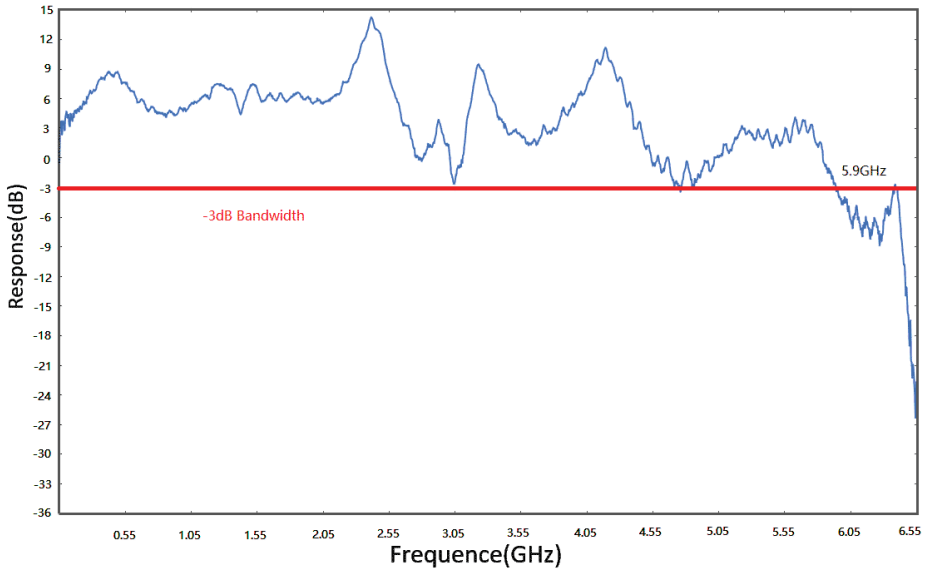
(all fiber types, SM, PM, MM, 900 to 1600nm,, high speed up to 0.3ns)

DATASHEET

Spectral Response



Typical Performance for 5GHz



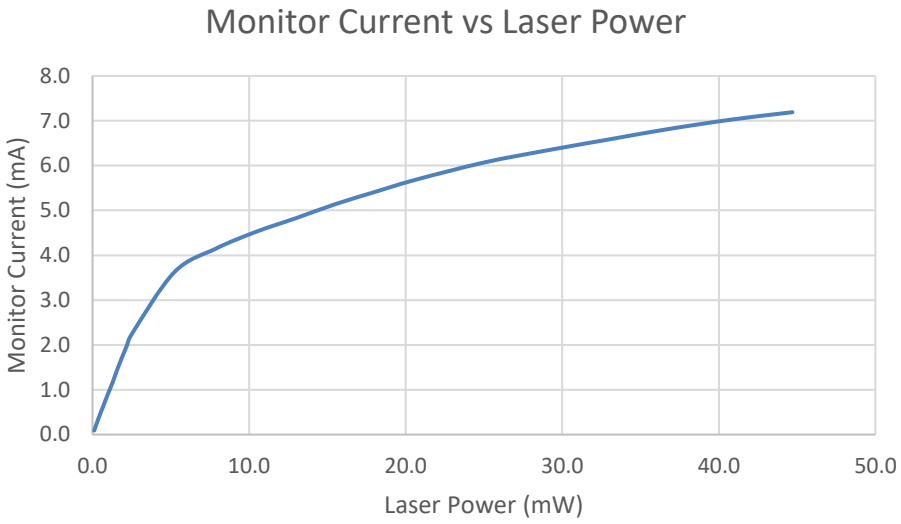
Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

Fiber Coupled High-Speed InGaAs PIN Photodiode

(all fiber types, SM, PM, MM, 900 to 1600nm,, high speed up to 0.3ns)

DATASHEET

Typical Response @ 1550nm



Amplifier Mounted Option



Low-Noise Optical Detector Amplifier

DETA-11A221111

$165

https://agiltron.com/product/precision-optical-detector-amplifier/

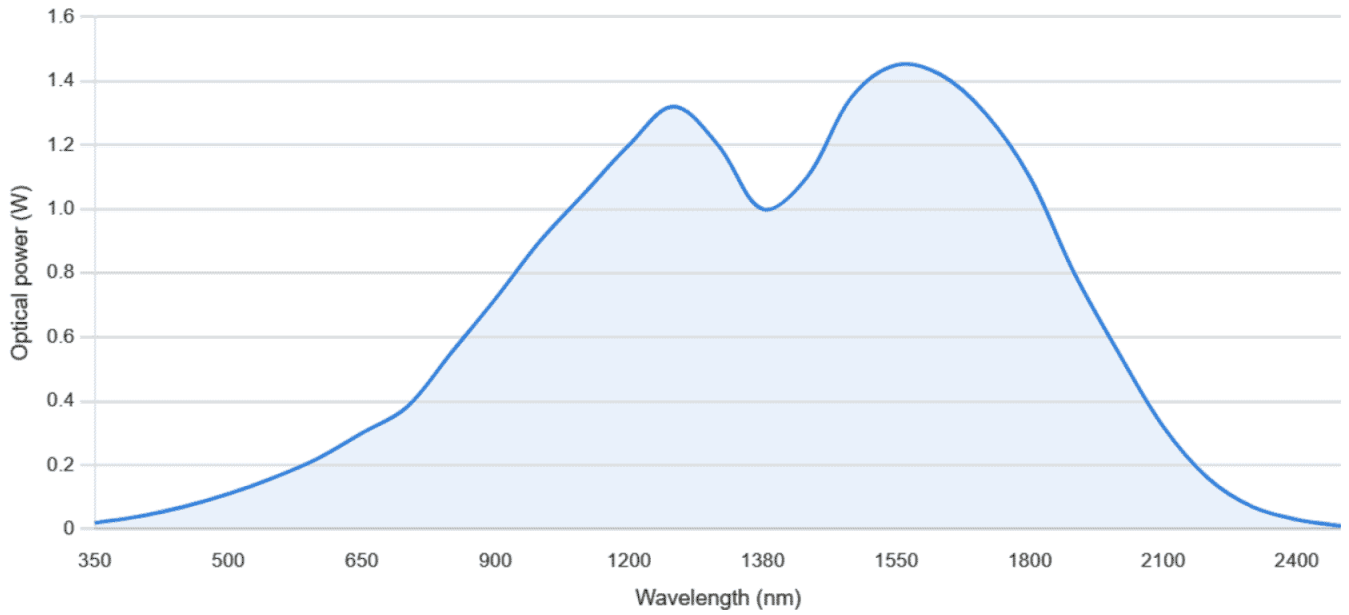
Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

Fiber Coupled High-Speed InGaAs PIN Photodiode

(all fiber types, SM, PM, MM, 900 to 1600nm,, high speed up to 0.3ns)

DATASHEET

Regular Single Mode / Polarization Maintaining Fiber Optical Power Handing vs Wavelength



Single mode fiber optical power is limited by nonlinear effects in addition to absorption that increase loss and generate heat. The curve shows the approximate safe CW power envelope for standard single-mode fiber. Actual limits depend on fiber design, core size, length, and laser characteristics. Specialty fibers can significantly increase the power limit.

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.