

# Fiber Coupled High-Speed InGaAs PIN Photodiode

(900 to 1600nm, high speed 0.3ns, all fiber types)



DATASHEET

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## Applications

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

## Features

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

The Fiber Coupled High-Speed InGaAs PIN Photodiode is based on a unique package featuring a high-speed, fast rise and fall response. The component integrates a fiber with a high-sensitivity photodiode for signal detection. The response is analog without TIAC. Our design minimizes component assembly costs and module footprint while increasing stability over wide temperature and wavelength ranges. We offer three response speeds of 200MHz, 2.5GHz, and 5GHz. The slow version uses a larger detector size, which provides higher efficiency, while the fast version uses a smaller detector size to increase the response speed.

Associated sensor electronic amplifier is also available.

## Specifications

Parameter	Min	Typical	Max	Unit
Central Wavelength	900		1600	nm
Responsivity <sup>[1]</sup>	0.7	0.9		A/W
Input Power	-45		17	dBm
PDL <sup>[2]</sup>		0.03	0.05	dB
Polarization extinction ratio <sup>[3]</sup>	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	0.2	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.

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Rev 11/11/24

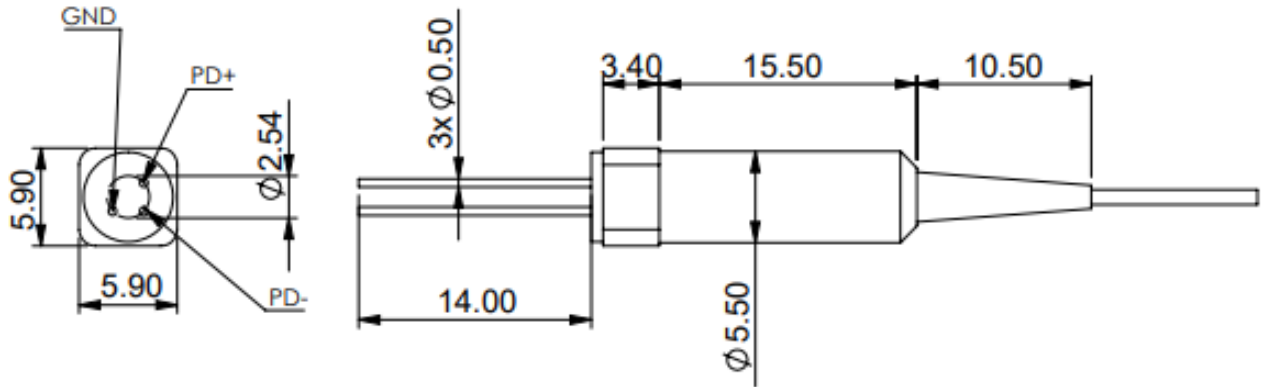
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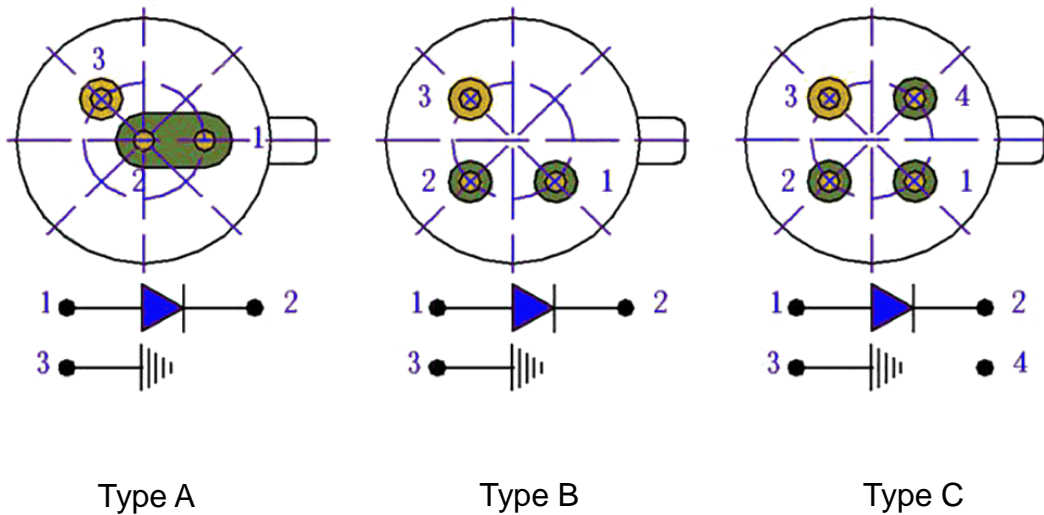
### Mechanical Footprint Dimensions (mm)



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



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### Ordering Information

Prefix	Wavelength	Speed	TEC Cooling	Package	Fiber Type	Fiber Cover	Fiber Length	Connector
<b>FCHI-</b>	900 - 1620 = 1 Special = 0	0.2GHz=8 2.5GHz= 2 5GHz =5	No = 1 Single Stage=2 Dual Stage = 3	Standard = 1 Special = 0	Choose from table below	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

*Fiber Type Selection Table:*

01	<b>SMF-28</b>	34	<b>PM1550</b>	71	<b>MM 50/125µm</b>
02	<b>SMF-28e</b>	35	<b>PM1950</b>	72	<b>MM 62.5µm</b>
03	<b>Corning XB</b>	36	<b>PM1310</b>	73	<b>105/125µm</b>
04	<b>SM450</b>	37	<b>PM400</b>	74	<b>FG105LCA</b>
05	<b>SM1950</b>	38	<b>PM480</b>	75	<b>FG50LGA</b>
06	<b>SM600</b>	39	<b>PM630</b>	76	<b>STP 50/125</b>
07	<b>Hi780</b>	40	<b>PM850</b>		
08	<b>SM800</b>	41	<b>PM980</b>		
09	<b>SM980</b>	42	<b>PM780</b>		
10	<b>Hi1060</b>	43	<b>PM350</b>		
11	<b>SM400</b>	44	<b>PM405</b>		
12		45	<b>PM460</b>		
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 handling by expanding the core side at the fiber ends.

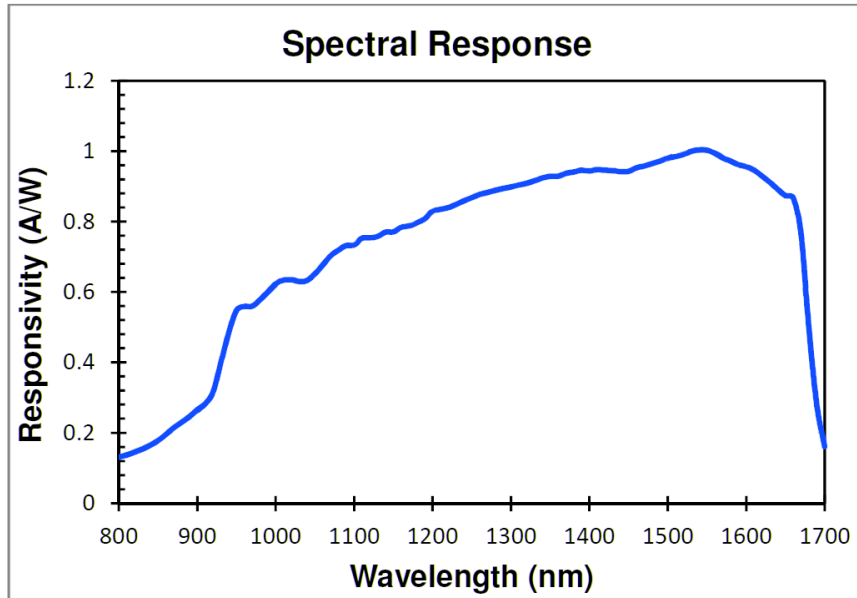
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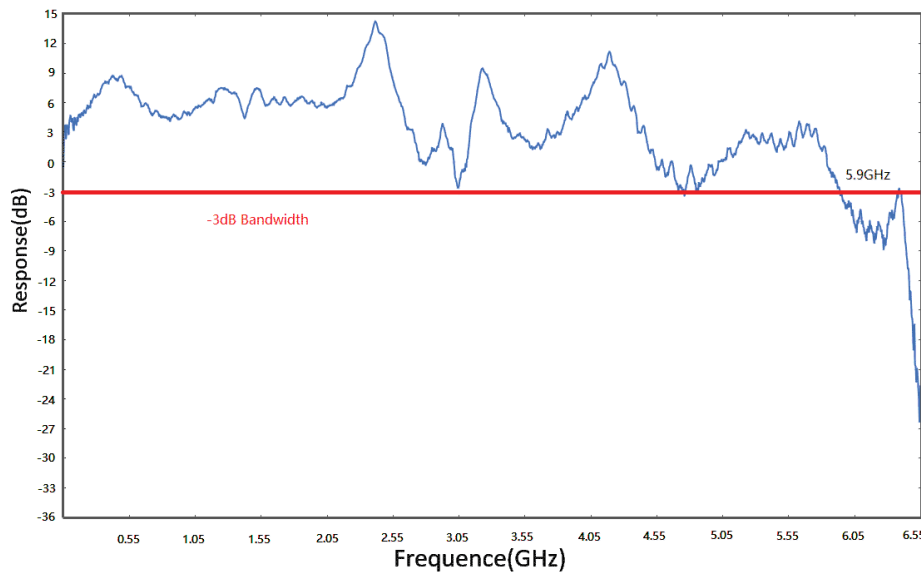
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### Spectral Response



### Typical Performance for 5GHz



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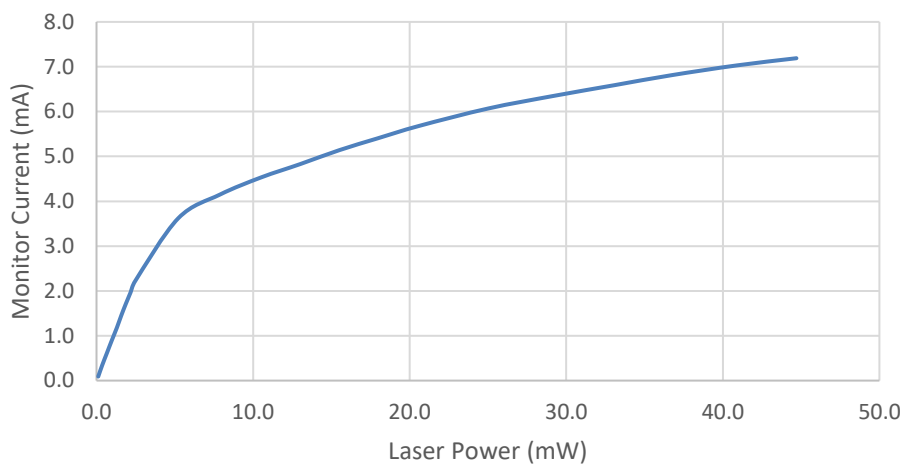
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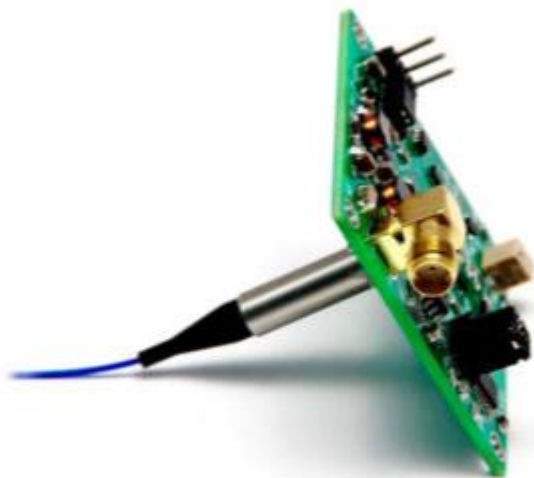
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## Typical Response @ 1550nm

Monitor Current vs Laser Power



## Amplifier Mounted Option



### Low-Noise Optical Detector Amplifier

DETA-11A221111

\$165

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