Fiber Coupled Si APD Photodiode

(450 to 900nm, high efficiency>90%, all fiber types)

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Avalanche photodiodes (APDs) offer a better signal-to-noise ratio (SNR) than PIN photodiodes, primarily in low-light or low-signal conditions. Specifically, the SNR advantage of APDs is most significant when:

1. In low-light conditions, APDs provide internal gain (multiplication of photocurrent), boosting weak signals before noise from downstream electronics becomes significant. This leads to improved SNR compared to PIN diodes, which lack internal gain and are limited by amplifier noise at low signal levels.
2. APDs typically have higher capacitance and lower bandwidth than PINs for the same area. When the application doesn't require ultra-high-speed operation, APDs can be beneficial due to the improved SNR from gain.
3. APDs multiply the signal but also introduce excess noise due to the stochastic multiplication process. However, when the dominant noise source is thermal (like preamp noise in a PIN system), the APD's gain outweighs the multiplication noise.

Associated sensor electronic driver or amplifier is also available

Features

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

Applications

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

Specifications

Parameter	Min	Typical	Max	Unit
Wavelength	650		900	nm
Optical Coupling Efficiency		90		%
Responsivity [2] (800nm, oe=1mW, 100V)	30		50	A/W
Input Power			50	mW
Polarization extinction ratio [4]	18	23		dB
Dark Current at 23°C, 100V		0.05	0.1	nA
Reverse Voltage		60	100	V
RF Bandwidth		0.1		GHz
Operating Temperature	-20		75	°C
Storage Temperature	-40		85	°C
Reliability	Telcordia 1209 and 1221			

Notes:

[1]. Insertion Loss excluding connectors

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

[3]. Single Mode Fiber version only

[4]. PM Fiber version only

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.**

Rev 05/23/25

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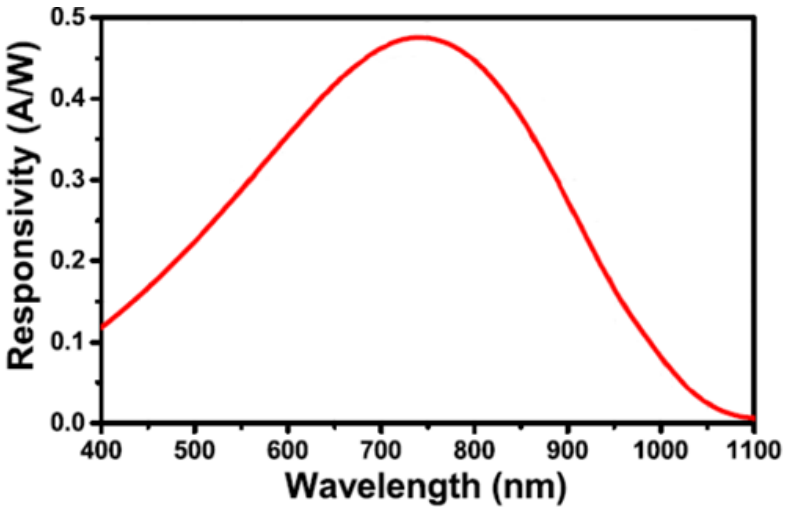
Typical Characters



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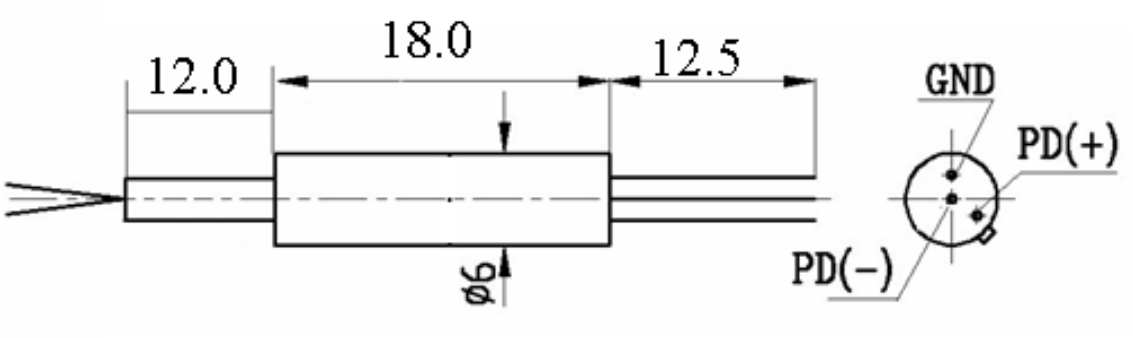
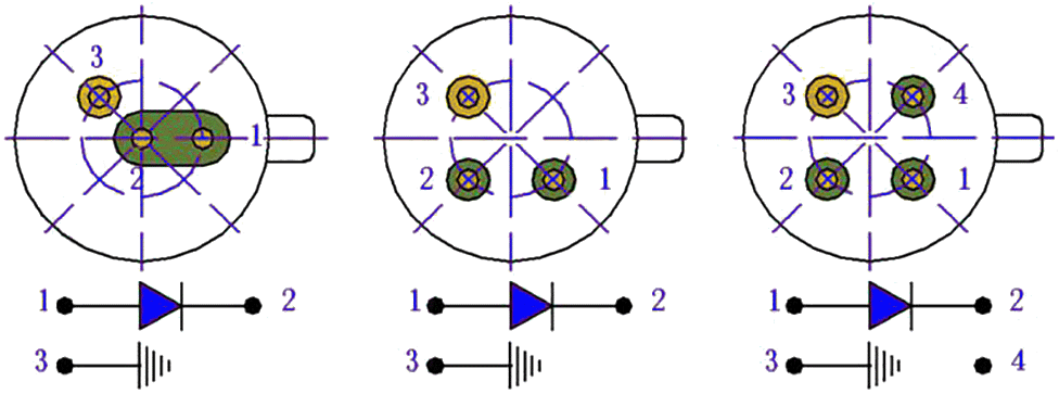
Mechanical Footprint Dimensions (mm)



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



Type A Type B Type C

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Ordering Information

	S	2	1	1	☐☐	☐	☐	☐
Prefix	**Wavelength**	**AR Coating**	**TEC Cooling**	**Package**	**Fiber Type**	**Fiber Cover**	**Fiber Length**	**Connector**
FCSA-	450-900 = S Special = 0	Yes = 2	No = 1 Yes = 2	Standard = 1 Special = 0	Choose from table below	900umTube = 3 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	**SMF-28**	34	**PM1550**	67	**STP 50/125µm**
02	**SMF-28e**	35	**PM1950**	68	
03	**Corning XB**	36	**PM1310**	69	
04	**SM450**	37	**PM400**	70	
05	**SM1950**	38	**PM480**	71	**MM 50/125µm**
06	**SM600**	39	**PM630**	72	**MM 62.5µm**
07	**Hi780**	40	**PM850**	73	**105/125µm**
08	**SM800**	41	**PM980**	74	**FG105LCA**
09	**SM980**	42		75	**FG50LGA**
10	**Hi1060**	43		76	**200 µm**
11	**Draka BBE**	44		77	**400 µm**
12		45		78	**800 µm**
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.

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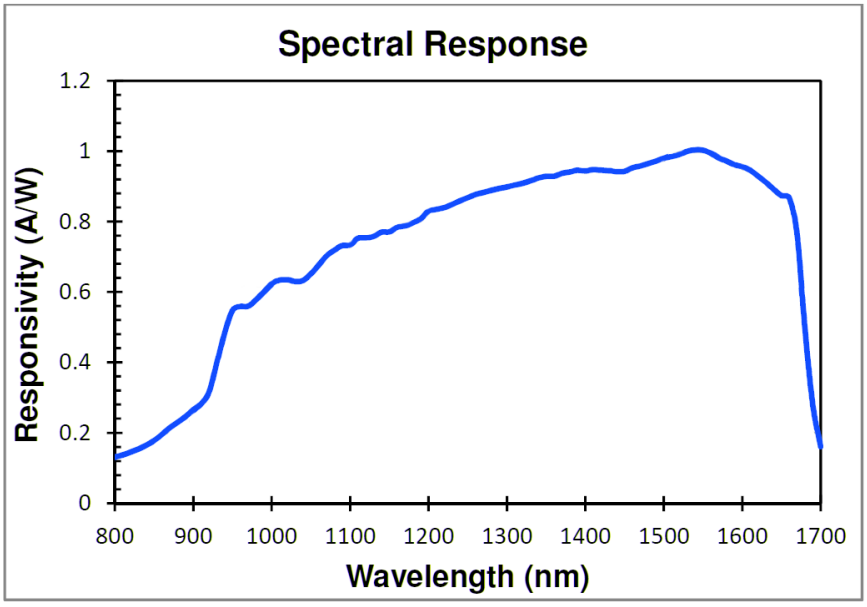
Spectral Response



Amplifier Mounted Option

Low-Noise Optical Detector Amplifier

DETA-11A221111

$165

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

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