10GHz PIN Preamp Detector/Receiver

one stage GaAs HBT preamp

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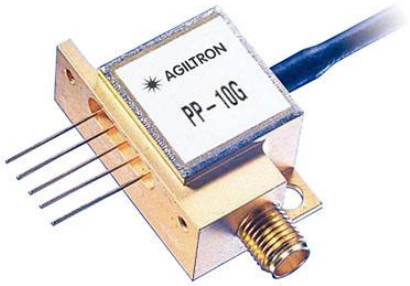

The PP-10G module consists of a low capacitance photodetector and a low noise GaAs transimpedance amplifier in a hermetic package with a connectorized single-mode fiber pigtail and a 50 Ω SMA electrical output. HBT is a linear amplifier.

Features

- Low Capacitance High Speed InGaAs PIN Detector
- GaAs HBT Preamp IC Chip
- Single Polarity Power Supply
- 11GHz Bandwidth
- Wide Dynamic Range
- Hermetically Sealed.
- Bellcore TR-NWT-000468 Compliant

Applications

- Long and Short Reach SONET/SDH Systems
- Optically Preamplified Receivers
- Datacom Systems up to 12.5 Gb/s

Specifications

Parameter	Min	Typical	Max	Unit
NRZ Data Rate		10		Gb/s
Module PIN bias voltage	9.5	11.5	13.5	V
Positive supply	7.5	8	8.5	V
Power dissipation		1	1.6	W
PIN responsivity [1]		0.88		A/W
PIN responsivity [5]		0.83		A/W
Responsivity variation with temperature 0°C to 70°C		5		%
Dark current (25°C)			10	nA
Optical connector loss		0.3		dB
Sensitivity [2]	-18	-19		dBm
Optical saturation power (BER< 10^{-9})	0			dBm
Average input equivalent noise current density 30kHz - 10GHz			16.5	pA/√Hz
High frequency -3dB corner [3]		11		GHz
Transimpedance gain [3], [4]	400	500	650	Ω
Trans. gain variation with supply voltage and temperature [3]	-15		+15	%
Output return loss [3] 100kHz - 8GHz	10			dB
Operating case temperature	0		70	°C
Storage temperature	-50		70	°C
SM fiber pigtail connector options	Standard SC-PC, Custom ST-PC, FC-PC			
Positive supply		9		V
Maximum optical input [6]			10	dBm
Maximum module PIN bias voltage			15	V
Maximum peak module PIN current			3	mA
Minimum fiber bend radius	35			mm

Notes:

[1]. Excluding optical connector loss. Optical wavelength is in the 1300nm region and between 1525 - 1575nm.

[2]. For 10^{-10} BER, PRBS 2^{23}-1. NRZ @10Gb/s

[3]. Load impedance is 50Ω with a return loss > 20dB, up to 20GHz

[4]. Excluding PIN responsivity factor and connector loss

[5]. Excluding optical connector loss. Optical wavelength is in the range 1576 - 1610nm

[6]. The optical level that causes no damage to the module. Performance specified in this document is not guaranteed at this input power.

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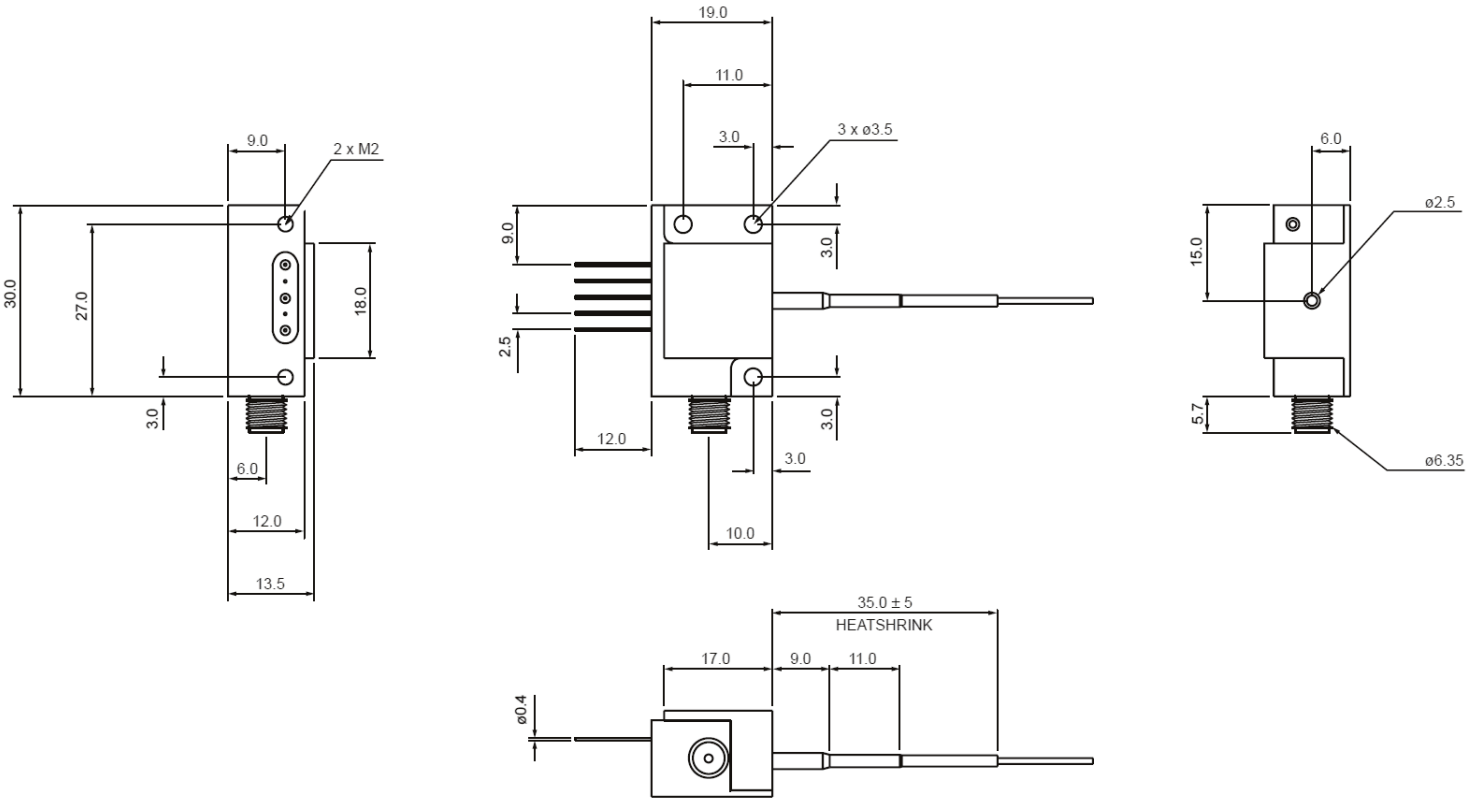
Dimensions (mm)



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

Pin Definition and Instructions for Use

Pin 1 PIN Bias
A DC voltage, between 9.5V and 13.5V, to reverse bias the PIN. This voltage should be present BEFORE the Positive Supply (pin 3) is applied to prevent the possibility of forward biasing the PIN (which will damage the device). Power down sequence is: pin 3, then pin 1.
This pin should be decoupled externally to minimize conducted noise from the power rails.

Pin 2, 4, 5 Ground
Ground all pins for optimum performance.

Pin 3 Positive Supply
DC voltage between 7.5 and 8.5V provides power to the pre-amplifier IC. This pin should be decoupled externally to minimize conducted noise from the power rails. The source should be capable of supplying up to 150 mA.

SMA Electrical Output
Device output is via the SMA connector and should be delivered into a 50Ω load. There is a DC offset of approximately 3V on this pin, so most applications will require that the output is AC coupled.

Pin #	Symbol	Function
1	PIN Bias	PIN Bias
2	GND	Case Ground
3	DC	Positive Supply
4	GND	Case ground
5	GND	Case ground
SMA	SMA	Electrical Output

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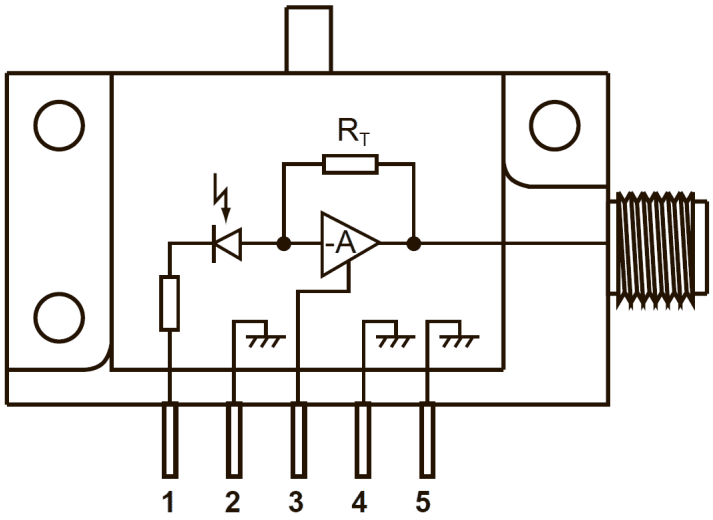
Receiver Schematic



Recommended Circuit Diagram

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Ordering Information

	1	1	10	1	1	11	☐
Prefix	**Detector Type**	**Wavelength Range**	**Bandwidth**	**Amplification**	**Module***	**Configuration**	**Connector**
AFDT-	PIN = 1 APD = 2	1200-1600nm = 1	10GHz = 10	Single Stage= 1	Device = 1 Yes = 2	Standard = 11	FC/PC = 2 FC/APC = 3 Special = 0

* Module contains driver and power supply.

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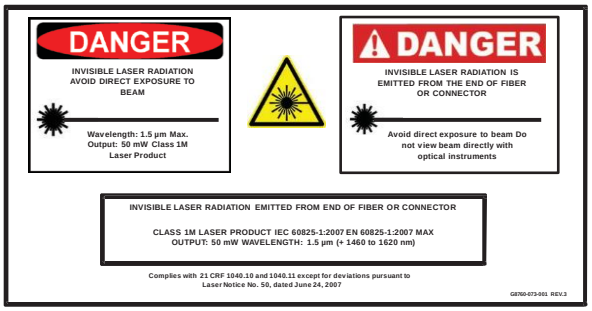
Laser Safety

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 1M laser product. This device has been classified with the FDA/CDRH under accession number 0220191. All versions of this laser are Class 1M laser products, tested according to IEC 60825-1:2007 / EN 60825-1:2007. An additional warning for Class 1M laser products. For diverging beams, this warning shall state that viewing the laser output with certain optical instruments (for example eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard. For collimated beams, this warning shall state that viewing the laser output with certain instruments designed for use at a distance (for example telescopes and binoculars) may pose an eye hazard.

Wavelength = 1.3/1.5 µm.

Maximum power = 30 mW.



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