

# PP - 10G

## 10Gb/s PIN Preamp Receiver

### 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.

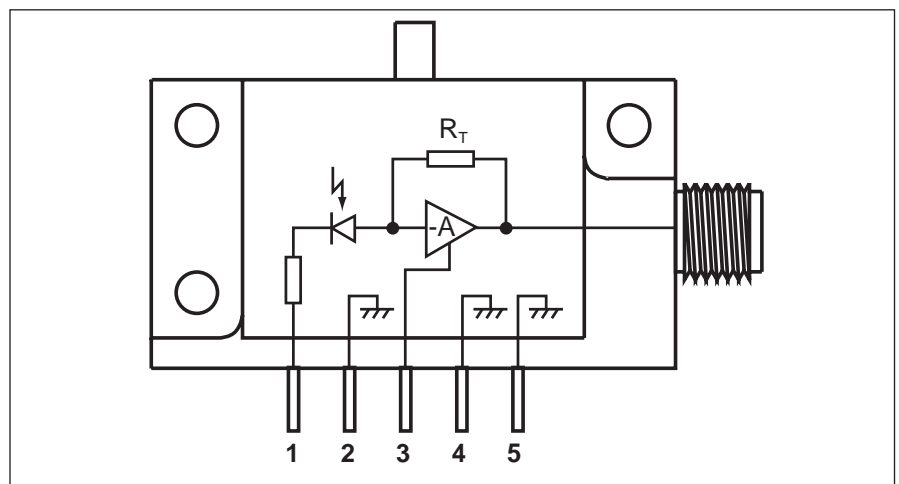
### Applications

Long and short reach SONET/SDH systems  
Optically preamplified receivers  
Datacom systems up to 12.5 Gb/s

### Description

The PP-10G module consists of a low capacitance photodetector and a low noise GaAs transimpedance amplifier in

an hermetic package with a connectorized single-mode fibre pigtail and a 50  $\Omega$  SMA electrical output.



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## Characteristics

Over entire temperature range, at end-of-Life

General	Min	Typ	Max	Unit
NRZ data rate		10		Gb/s
Operating case temperature	0		70	°C
Physical dimensions		30 x 19 x 13.6		mm
SM fibre pigtail connector options		Standard SC-PC, Custom ST-PC, FC-PC		

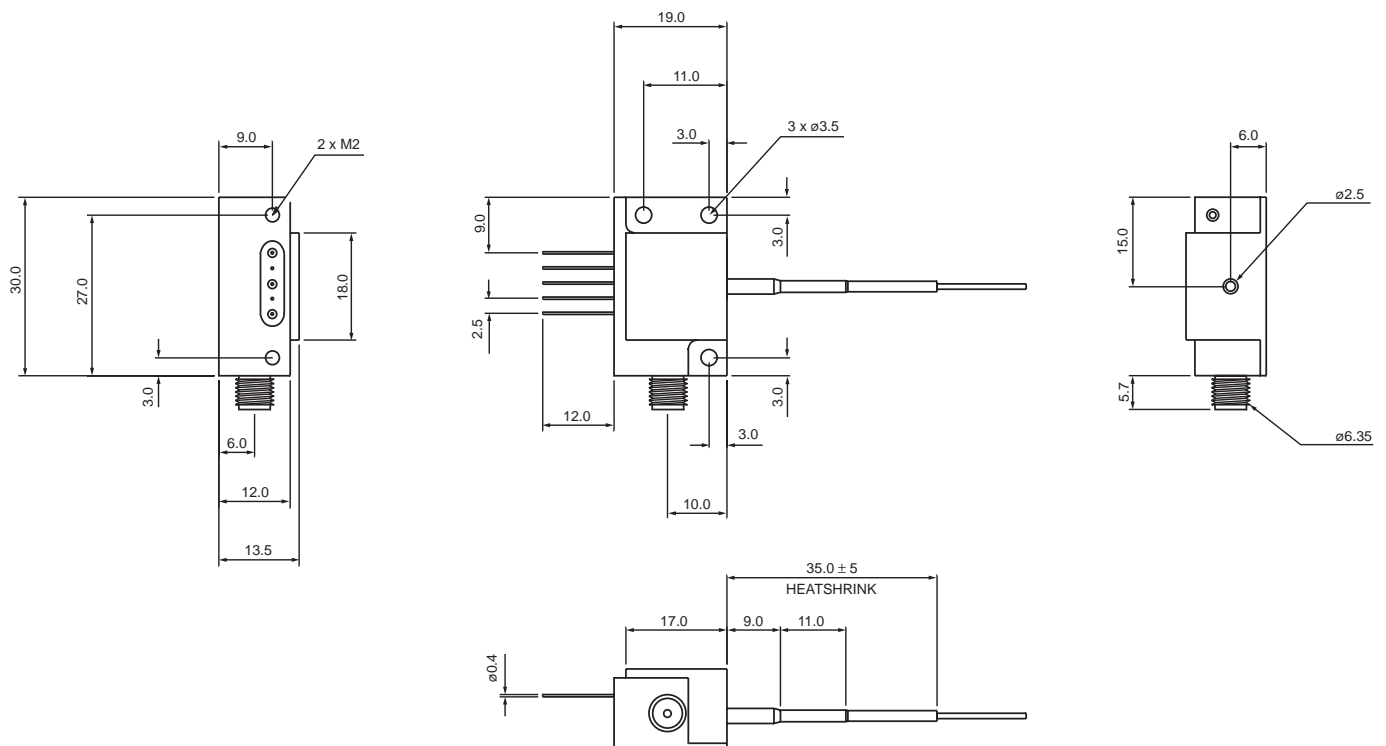
Performance	Symbol	Min	Typ	Max	Unit
Module PIN bias voltage	$V_m$	9.5	11.5	13.5	V
Positive supply	$V_{cc}$	7.5	8	8.5	V
Power dissipation	$P_d$		1	1.6	W
PIN responsivity (1)	R		0.88		A/W
PIN responsivity (5)	R		0.83		A/W
Responsivity variation with temperature 0°C to 70°C			5		%
Dark current (25°C)	$I_d$			10	nA
Optical connector loss			0.3		dB
Sensitivity (2)		-18	-19		dBm
Optical saturation power (BER < 10 <sup>-9</sup> )	$P_{sat}$	0			dBm
Average input equivalent noise current density 30kHz - 10GHz	$I_e$			16.5	pA/√Hz
High frequency -3dB corner (3)			11		GHz
Transimpedance gain (3,4)	TZG	400	500	650	Ohms
Trans. gain variation with supply voltage and temperature (3)		-15		+15	%
Output return loss (3) 100kHz - 8GHz		10			dB

Notes :

1. Excluding optical connector loss. Optical wavelength is in the 1300nm region and between 1525 - 1575nm.
2. For 10<sup>-10</sup> BER, PRBS 2<sup>23</sup>-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.

## Outline Drawing

Dimensions in mm



## Instructions for Use - PP-10G

### 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 minimise 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 minimise 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.

## Absolute Ratings

Parameter	Symbol	Ratings	Units
Positive supply	$V_{cc}$	9	V
Operating temperature (1)	$T_{op}$	0 to 70	°C
Storage temperature (2)	$T_{stg}$	-50 to 70	°C
Maximum optical input (3)	$P_o$	10	dBm
Maximum module PIN bias voltage	$V_m$	15	V
Maximum peak module PIN current	$I_m$	3	mA
Minimum fibre bend radius		35	mm

### Notes :

1. The operating temperature is defined as the temperature of the module case.
2. The storage temperature is defined as the ambient temperature.
3. The optical level that causes no damage to the module. Performance specified in this document is not guaranteed at this input power.

## Device Ordering Information

**PP - 10G** (Standard connector SC/PC (C28B))

Connector type FC/PC = C33

A Qualification Test Report QR1317B is also available for this device

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