PGR 203 14

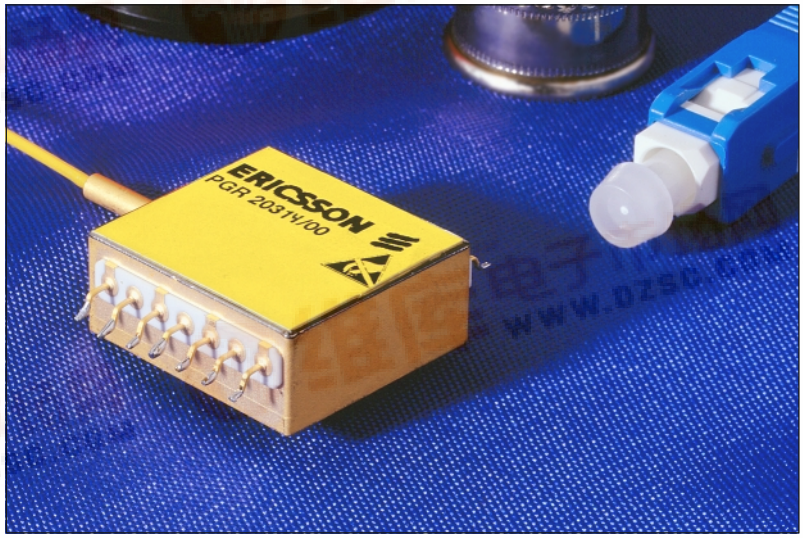
APD Receiver Module for 2.5 Gb/s

Key Features

- Hermetic, 14 pin butterfly package with multisourced footprint
- FC/PC, SC or ST connector
- InGaAs APD with low noise GaAs MMIC preamplifier
- AC-coupled, single-ended data output
- Operates between 1250 nm and 1620 nm
- 1.7 GHz typical bandwidth
- -34 dBm typical sensitivity
- -3 dBm typical overload

Applications

- SDH STM-16 LH
- SONET OC-48 LR
- Digital recievers to 2.5 Gb/s
- Analog receivers to 1.7 GHz



Description

Fiber optic receiver front-end module for STM-16 and OC-48 applications. The module includes an InGaAs Avalanche Photo Diode (APD), with a low noise GaAs MMIC preamplifier in a 14 pin butterfly package.The module is equipped with an internal thermistor. The single-mode fiber pigtail is terminated with a customer specified connector. The module operates between 1250 and 1620 nm. The electrical output is AC-coupled, single ended and inverted i.e., light on equals logic low.

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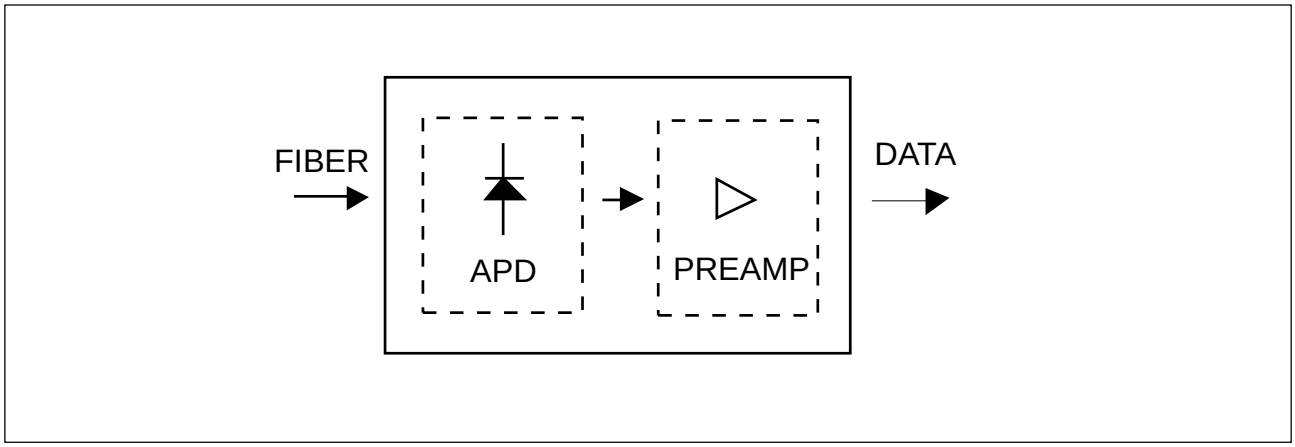

Figure 1. Block diagram

Pin connection

1.	GND	9.	GND
2.	Vapd (+HV)	10.	Data Out (AC-coupled)
3.	GND	11.	GND
4.	Vss (-5.2V)	12.	GND
5.	GND	13.	Vdd (+5V)
6.	Thermistor	14.	NC
7.	GND	Case	RF (and DC) GND
8.	GND		

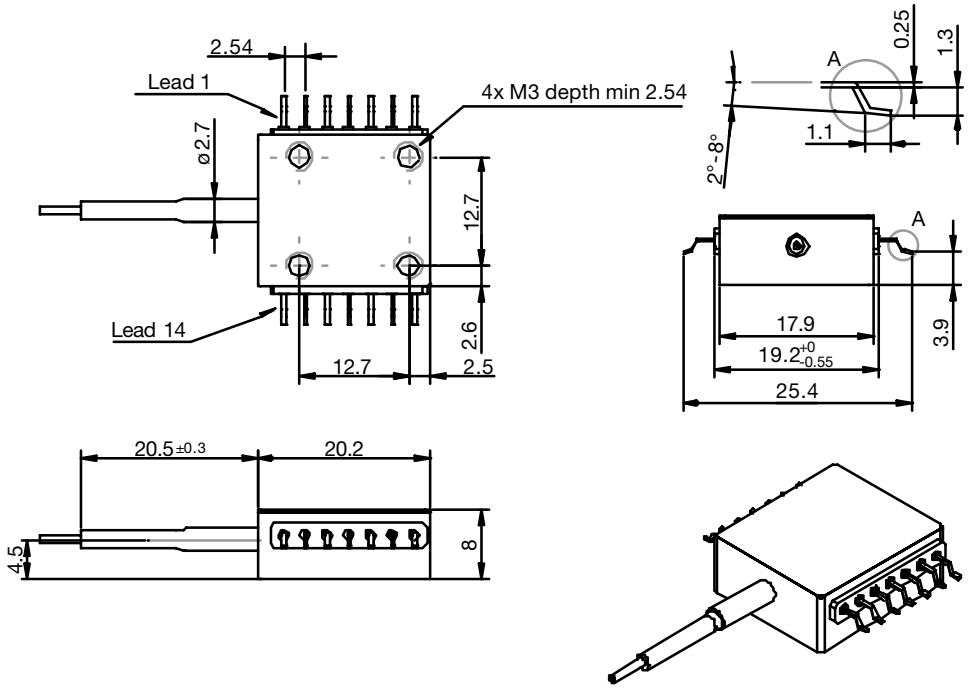

Figure 2. Pin description

Optical and Electrical AC Characteristics

Electrical and optical characteristics over recommended operating conditions, unless otherwise noted.

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Minimum bandwidth (-3dB)	-30dBm < Pf < -6dBm	BW_{min}	1.3	1.5	1.8	GHz
Bandwidth variation	-30dBm < Pf < -6dBm $BW_{max} = \alpha \cdot BW_{min}$	α		1.2	1.3	
Gain peaking		δ_{Peak}		0	1	dB
Sensitivity: Pf @ BER = $1 \cdot 10^{-10}$	2.5 Gbps NRZ, PRBS 2^{23}-1, λ =1550 nm	Pr		-34	-32	dBm
Overload: Pf @ BER = $1 \cdot 10^{-10}$	2.5 Gbps NRZ, PRBS 2^{23}-1, λ =1550 nm	Pol	-6	-3		dBm
Output signal swing	-30dBm < Pf < -6dBm R_L = 50Ω, λ = 1550nm, ER ~10	V_{Out}	20		1000	mV_{P-P}
AC transimpedance	R_L = 50Ω, Tz = dV_{Out}/I_{Ph}, ave	Tz		1.8		kΩ
Logic sense	Data out		Light "ON" = Logic "LOW"			

Optical and Electrical DC Characteristics

Electrical and optical characteristics over recommended operating conditions, unless otherwise noted.

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
DC Power supply current		I_{dd}		115	130	mA
		I_{ss}		90	100	mA
Power consumption		P_{Con}		1.0	1.25	W
APD Responsivity	λ = 1300 nm, M = 12	$R_{13(12)}$		10.5		A/W
	λ = 1550 nm, M = 12	$R_{15(12)}$		11.5		A/W
Thermistor, NTC	T = 25°C	$R_{Th(25)}$	2925	3000	3075	Ω
Optical reflectance		s11			-27	dB

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Optical wavelength	λ	1250		1620	nm
Case temperature	T_{Case}	0		70	°C
DC Power supply voltage	V_{dd}	4.7	5.0	5.3	V
	V_{ss}	-5.5	-5.2	-4.9	V
APD bias	V_{Pin}	30		85	V

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
DC Power supply voltage	V_{dd}	-0.5	6.5	V
	V_{ss}	-7.0	0.5	V
Storage temperature	T_{Stg}	-40	85	°C

CAUTION: *Stresses outside those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.*

Handling Precautions

This device may be damaged as a result of electrostatic discharge (ESD). Take proper precautions during both handling and testing. This typically includes grounded wrist wraps, workbenches and floor mats in ESD controlled areas. Semiconductor devices may be damaged by current surges, use appropriate transient protection.

Quality Assurance

Ericsson Microelectronics commitment to quality has been proven through a decade of semiconductor device production and has been confirmed to ISO 9001. Opto product qualification is made according to the intention of applicable Telcordia standards.

Connector Options

FC/PC
SC
ST
(Other connectors available on request)

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