


10Gb/s surface mount coplanar APD preamp receiver for low OSNR applications

AT10GC

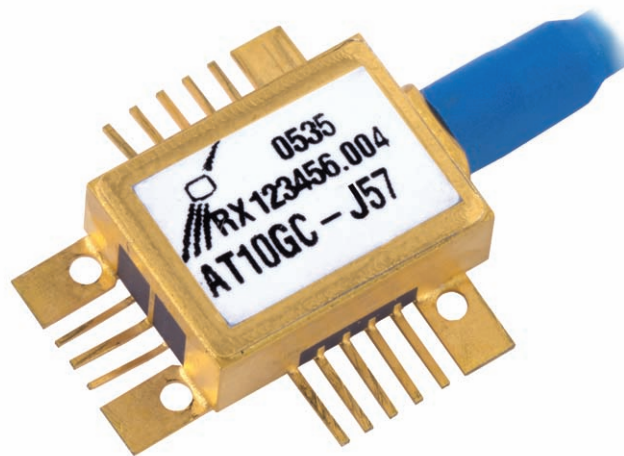
The AT10GC receiver consists of an avalanche photodiode, a low-noise preamplifier and a precision NTC thermistor in a hermetic coplanar package with a connectorized single-mode fiber pigtail. Differential outputs are provided to improve noise rejection for enhanced sensitivity. It has been optimised for use in 10Gb/s metro applications, either as a discrete device or within a transponder, using NRZ modulation, with or without FEC, at data rates up to 10.709Gb/s.

Features:

- Sensitivity, -26.5dBm typical
- Low capacitance high speed InGaAs APD photodetector
- Supports FEC rates up to 10.709Gb/s
- Designed to exceed the environmental requirements of Telcordia GR-468-CORE
- RoHS 5/6 compliant 

Applications:

- Client or line side links
- 300 pin LR transponder applications



Operating Characteristics

Case Temperature = 25°C unless otherwise specified

Parameter	Symbol	Measurement Conditions	Min	Typ	Max	Unit
Optical sensitivity BOL [1] [2]	Sens	2 ³¹ -1 PRBS BER<10 ⁻¹² V _{optimal} = V _{M10}		-26.5	-24.5	dBm
Sensitivity penalty EOL over temperature [1] [2]		2 ³¹ -1 PRBS BER<10 ⁻¹² V _{optimal} = V _{M10} T=-40 to +85°C		0.75	1.0	dB
Deviation from linear phase		DC - 6GHz	-10		+10	°
High frequency -3dB corner	f _H	V _{APD} =V _{M10} Small signal	7			GHz
Low frequency -3dB corner	f _L				40	kHz
Transimpedance gain [3] [4] [5]	T _Z	Small signal	1.1	1.4	2.5	kΩ
Maximum output voltage [6]	V _{OUT}	Peak-to-peak		500	700	mV
Return loss	S ₂₂	DC to 8.0GHz			-8	dB
Optical overload [2]	P _{SAT}	2 ³¹ -1 PRBS V _{APD} =V _{M3} BER<10 ⁻¹²	-3	-1		dBm
APD breakdown voltage	V _{br}	I _{APD} =10μA	20		40	V
APD breakdown voltage temperature coefficient	T _{Vbr}		0.030		0.061	V/°C
Dark current	I _d	At 90% of V _{br}			100	nA
Amplifier bias current	I _{ee}			75	90	mA
Input current for output limiting	I _{in lim}	Peak-to-peak		1000		μA
Transimpedance amp supply voltage	V _{ee}			-5.2		V
Thermistor resistance	R _{TH}			10		kΩ

Notes:

- [1] Optical Wavelength between 1525-1575nm. Data to 1610nm available on request.
- [2] Measured with 9.95Gb/s, extinction ratio > 12dB, Q factor > 30, 50% crossing level, 1550nm.
- [3] Load impedance is 50Ω AC-coupled with a return loss > 20dB, up to 20GHz.
- [4] Excludes APD responsivity.
- [5] Differential.
- [6] Single ended.

Absolute Maximum Ratings

The table below provides maximum and/or minimum values of critical parameters which will not permanently damage the device, but for which the operating specification may not hold.

Parameter	Symbol	Min	Max	Units
Amplifier bias voltage	V_{ee}	-6.0	0.5	V
Operating temperature [1]	T_{op}	-40	+85	°C
Storage temperature [2]	T_{stg}	-40	+85	°C
Input photocurrent	I_{PD}		3	mA
APD bias voltage	V_{APD}	0	V_{br}	V
Fiber bend radius		20		mm

Notes:

[1] The operating temperature is defined as the temperature of the module case.

[2] The rating is referred to the ambient temperature.

Class 2 ESD precautions must be observed when handling these devices.

Pin Out

Pin #	Symbol	Function	Pin #	Symbol	Function
1	NC	Case ground	10	Out_P	Positive output
2	V_{pd}	APD bias voltage	11	GND	Case ground
3	NC	No connection	12	GND	Case ground
4	NC	Amplifier bias	13	FBIN	Offset feedback
5	NC	No connection	14	NC	No connection
6	GND	Case ground	15	NC	No connection
7	GND	Case RF ground	16	Rth	Thermistor
8	Out_N	Negative RF data output	17	GND	Case ground
9	GND	Case ground			

Circuit Schematic

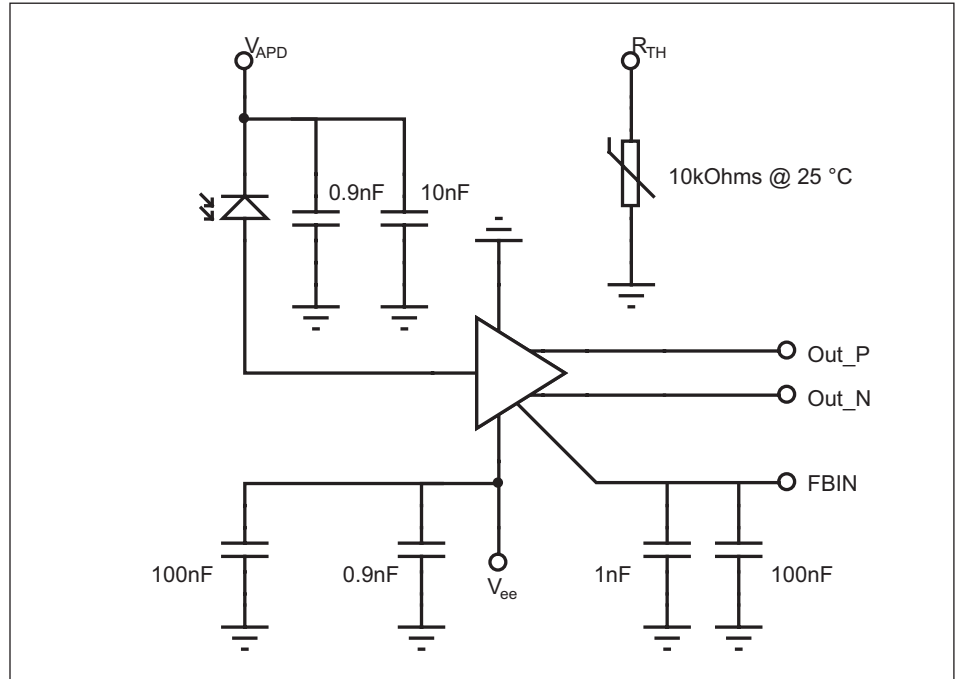
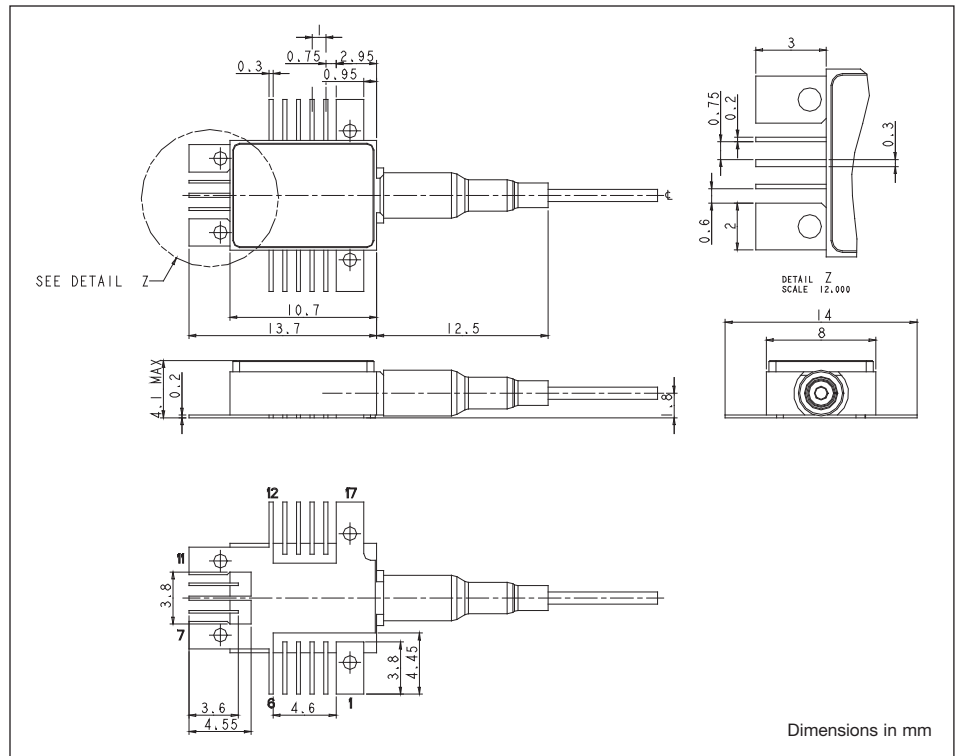


Figure [1] AT10GC Circuit schematic.

Outline Drawing



Dimensions in mm

Figure [2] Outline diagram (Illustration only. For full details, refer to appropriate assembly drawing.)
 Note: Fiber is 900mm secondary coated single-mode fiber, length = 1100 +0/-200mm.

RoHS Compliance



Bookham is fully committed to environment protection and sustainable development and has set in place a comprehensive program for removing polluting and hazardous substances from all of its products. The relevant evidence of RoHS compliance is held as part of our controlled documentation for each of our compliant products. RoHS compliance parts are available to order, please refer to the ordering information section for further details.

Ordering Information:

AT10GC - (Connector)
 J = SC/PC
 J57 = LC

e.g. AT10GC-J is an AT10GC with an SC/PC connector.

Other options available on request

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