10Gb/s Wide Bandwidth Linear PIN Receiver

PT10HGC

The PT10HGC receiver consists of a PIN photodiode, a low-noise preamplifier in a hermetic package with a connectorised single-mode fibre pigtail. The wide linear operating region permits the use of electronic dispersion compensation (EDC) and other impairment mitigation schemes. Differential outputs are provided for improved power supply noise rejection. Its high bandwidth has been optimized for use in 10+Gb/s long-haul applications, either as a discrete device or within a transponder, using RZ or NRZ modulation with or without FEC, at data rates up to 12.5Gb/s.

Features:

- Wide linear operating region from sensitivity up to -2dBm
- Surface mount MSA compliant
- Low capacitance high speed InGaAs PIN photodetector
- Supports data rate up to 12.5Gb/s
- Single mode fibre tail with choice of connector
- Low Power Consumption, 165mW typical
- Designed to exceed the environmental requirements of Telecordia GR-468-CORE
- RoHS compliant

Applications:

- Client or line side links with or without EDC
- Ultra long-haul links
- 300 pin LR transponder applications
- Ideal for applications with slicing threshold control, EDC, and other impairment mitigation techniques

Optical Characteristics

Specified case operating temperature range is -5ºC to +85ºC (typical values reflect 25ºC case temperature)

Parameter	Symbol	Measurement Conditions	Min	Typ	Max	Unit
Optical sensitivity BOL [1] [2]	Sens	2^{31}-1 PRBS BER<10^{-12} V_{pd} = 8V		-19.5	-18.0	dBm
Sensitivity penalty EOL over temperature [1] [2]		2^{31}-1 PRBS BER<10^{-12} T= -5 ºC to +70˚C		0.5	1.0	dB
Deviation from linear phase		DC – 6GHz	-10		+10	°
High frequency -3dB corner [3]	f_H	V_{pd}= 8V Small signal	10.5	12		GHz
Low frequency -3dB corner [3]	f_L	23µApp		40	90	kHz
Transimpedance gain [3] [4] [5]	T_Z	10MHz, 40 µApp	580	860	1160	Ω
Maximum output voltage [3]	V_{OUT}	≤1.5mApp	740	900	1200	mV_{pp}
Return loss	S_{22}	DC to 6.0GHz			-8	dB
Optical overload [2]	P_{SAT}	I_{In}≥2000µApp	+1	+2		dBm
PIN Responsivity [1]	R		0.7	0.9		A/W
Dark current	I_d				10	nA
Amplifier bias current	I_{CC}		40	50	70	mA
Input current for onset of limiting	$I_{In\ AGC}$	1dB compression	650	1000	1700	µApp
Optical power at onset of limiting	$P_{LIM\ AGC}$	1dB compression	-3.6	-1.7	+0.6	dBm
PIN bias voltage	V_{pd}			5		V
Transimpedance amp supply voltage	V_{CC}		3.15	3.3	3.5	V

Notes:
[1] Optical Wavelength between 1525-1575nm. Data to 1610nm available on request.
[2] Measured with 10.709Gb/s, extinction ratio > 13dB, OSNR 35dB, 50% crossing level, 1550nm.
[3] Load impedance is 50Ω AC-coupled with a return loss > 20dB, up to 20GHz.
[4] Excludes PIN responsivity.
[5] Differential.

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 are not guaranteed.

Parameter	Symbol	Min	Max	Units
Operating temperature [1]	T_{op}	-40	+85	˚C
Storage temperature [2]	T_{stg}	-40	+85	˚C
Input Photocurrent (DC)	I_{PD}	-5	5	mA
PIN bias voltage	V_{PD}	0	15	V
Amplifier bias voltage	V_{cc}	-0.5	5.0	V
Fibre bend radius		20		mm
Maximum soldering temperature[3]			260	°C

Notes:
[1] The operating temperature is defined as the temperature of the module case.
[2] The rating is referred to the ambient temperature.
[3] 10s no closer than 1mm from the package body.

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

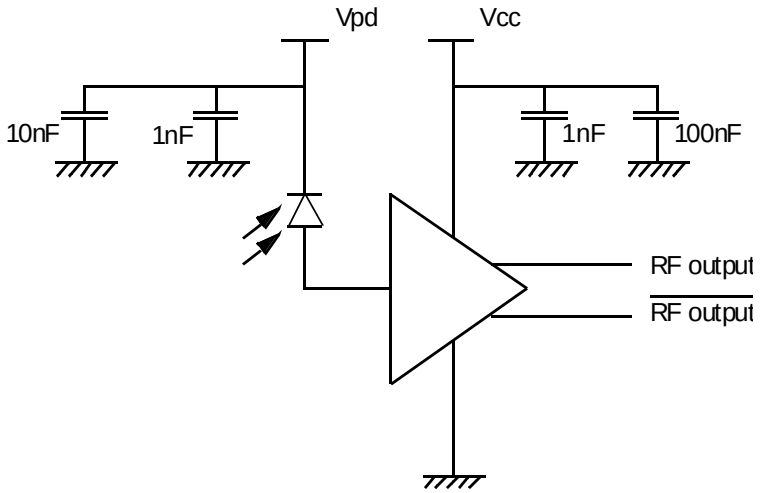
Fibre assembly

The fibre assembly consists of a Corning SMF-28e fibre, with a white 900µm tight jacket (Corning TB-II or equivalent) strippable to 250µm along its entire length. It has a minimum bend radius of 20mm. The assembly is terminated with an LC connector. The reference length is in the range of 1100mm +0/-200mm

Pin Out

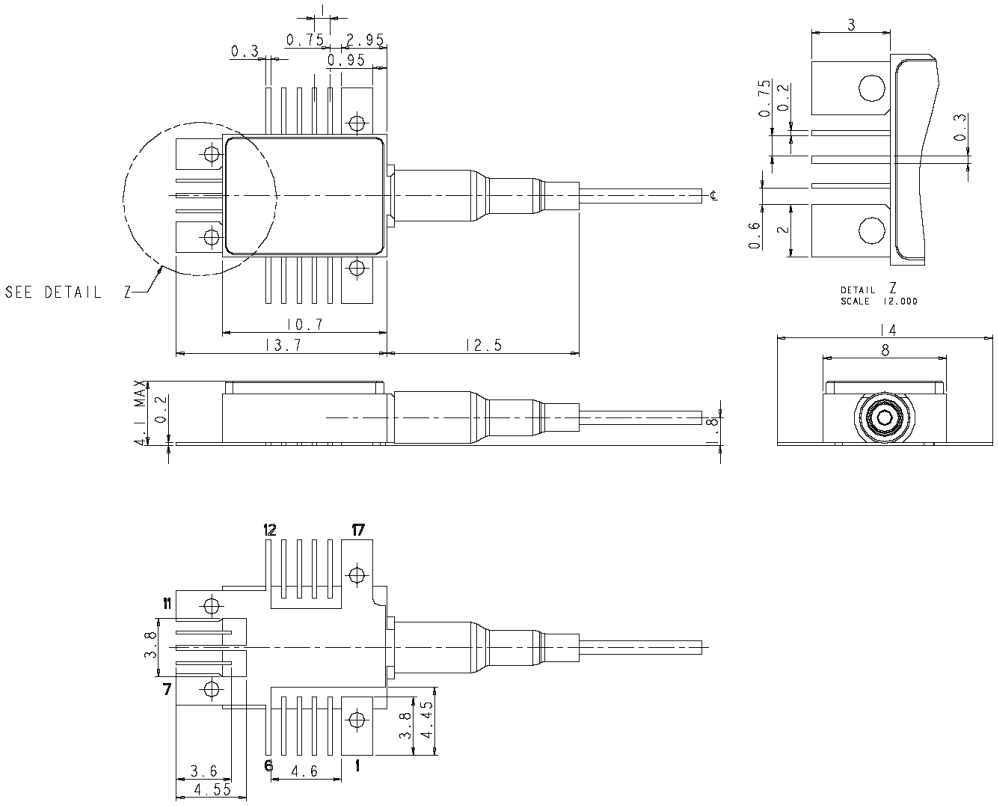
Pin #	Symbol	Function	Pin #	Symbol	Function
1	NC	Case ground	10	Out_P	Positive output
2	V_{pd}	PIN bias voltage	11	GND	Case ground
3	NC	No connection	12	GND	Case ground
4	NC	No connection	13	NC	No connection
5	NC	No connection	14	Vcc	TIA supply (+3.3V)
6	GND	Case ground	15	NC	No connection
7	GND	Case RF ground	16	NC	No connection
8	Out_N	Negative RF data output	17	GND	Case ground
9	GND	Case ground			

Circuit Schematic



Figure[1] PT10HGC Circuit Schematic

Outline Drawing



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

RoHS Compliance

Oclaro 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:

PT10HGC – (RoHS)(Connector)

J = 5/6 Yellow fibre
R = 6/6 Green fibre
57 = LC connector

e.g. PT10HGC-R57 is a RoHS 6/6 compliant PT10HGC with an LC/UPC connector and a green coloured fibre.

PT10HGC-J57 is a RoHS 5/6 compliant PT10HGC with an LC/UPC connector and a yellow coloured fibre.

Other connector and fibre options available on request.

Contact Information

www.oclaro.com

Important Notice

Performance figures, data and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing by Oclaro before they become applicable to any particular order or contract. In accordance with the Oclaro policy of continuous improvement specifications may change without notice. Further details are available from any Oclaro sales representative.

Caution - use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

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