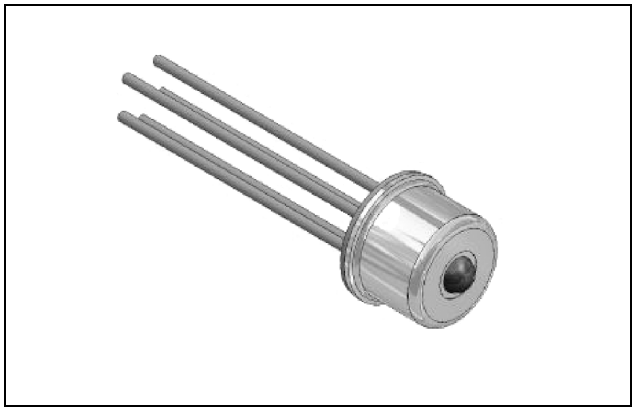
ZL60011

1310 nm, 1550 nm 2.5 Gbps PIN Preamplifier with Photo-current Monitor

Data Sheet

July 2004



Ordering Information

ZL60011/TBD TO-46 with lens

-40°C to +85°C

Features

- Data Rate up to 3.125 Gbps
- 1310 nm, 1550 nm PIN
- TO-46 Assembly
- Integrated TIA and limiting amplifier
- Single 3.3 V supply
- Differential Output
- Photocurrent monitor
- Low power consumption

Description

This optical receiver is a 3.3 V device which contains a PIN photodiode and a low noise transimpedance with limiting amplifier assembled with photocurrent monitor function in a TO-46 package with lens cap. It is designed for OC-48 operation and single mode fiber. Reliability Assurance based on Telcordia GR-468-CORE.

Applications

- Sonet OC-48
- SDH STM-16
- 2.125 Gbps fiber channel
- 0.1 to 3.125 Gbps multi Rate application

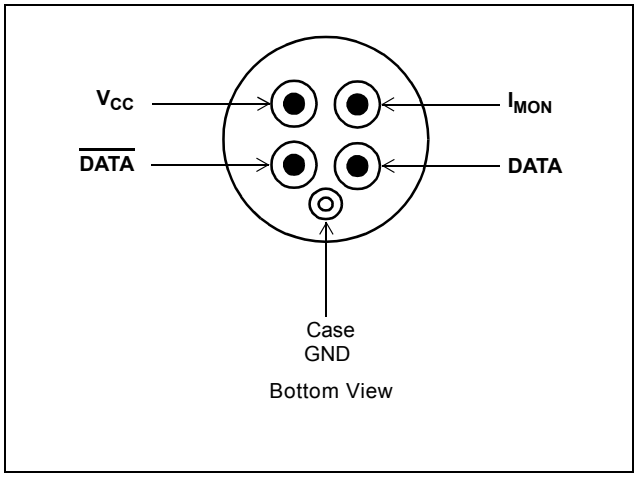


Figure 1 - Pin Diagram

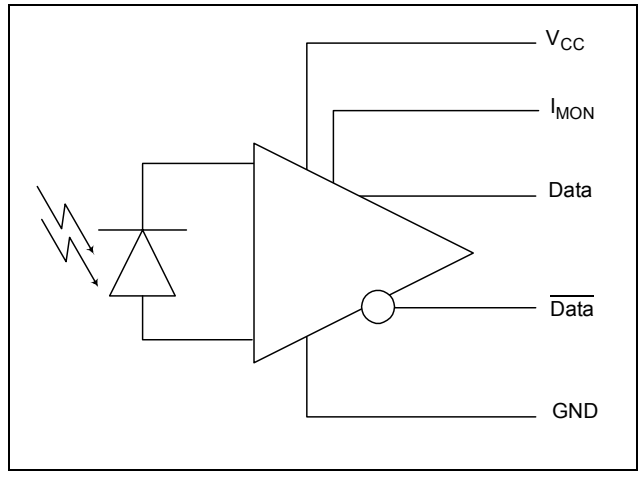


Figure 2 - Functional Schematic

Optical and Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Responsivity, differential	*R*	4	6		kV/W	λ = 1310 nm, $R_{L\ =}$ 100Ω, Note 1
Photo Monitor current	*Imon*		0.8		A/W	λ = 1310 nm, R_L = <2000Ω
Output voltage, differential	ΔV_O	200	300		mV_{pp}	R_L = 100Ω Note 2
Bandwidth ($3dB_{el}$)	f_c		2.0		GHz	Pf = 10 µW, R_L = 100Ω
Optical Saturation Level	P_{sat}	1	3.0		dBm	λ = 1310 nm, ER = ∞ Note 3
Noise-Equivalent Power	*NEP*		-35	-30	dBm	1λ = 1310 nm, Note 4
Sensitivity (BER 10^{-10})	*S*		-25	-23	dBm	λ = 1310 nm, ER = ∞ Note 3
Output Resistance (single)	R_o		50		Ω	
Power Dissipation	P_D		85	140	mW	
Power Supply Current	I_{DD}		25	38	mA	DATA & $\overline{\text{DATA}}$ AC Coupled

Operating Conditions: 25°C Case Temperature/3.3 V Supply Voltage/Fiber: Single-mode fiber.
Pattern 2^{23} -1 at 2.5 Gbps.

Note 1: Pf = 10 µW Peak-Peak Power
Note 2: Pf = 500 µW Peak-Peak Power
Note 3: Measured at 10^{-10} BER with a 2^{23}-1 PRBS at 2.5 Gbps
Note 4: Measured with STM-16 filter on electrical output, e.g. 1.875 GHz

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	V_{CC}	0	3.6	V
Storage Temperature	T_{stg}	-40	125	°C

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}-V_{EE}	3	3.3	3.6	V
Operating Temperature	T_{op}	-40		85	°C
Signalling Rate, Note 5	f_D	0.155		3.125	Gbps

Note 5: Data pattern have maximum runlength and DC-balance shifts no more than that of a PRBS-31 pattern.

Typical Responsivity

	Wavelength	Fiber core/cladding diameter numerical aperture
		10/125 µm, NA = 0.11
Differential responsivity	1310 nm	6 kV/W
Differential responsivity	1550 nm	7.4 kV/W

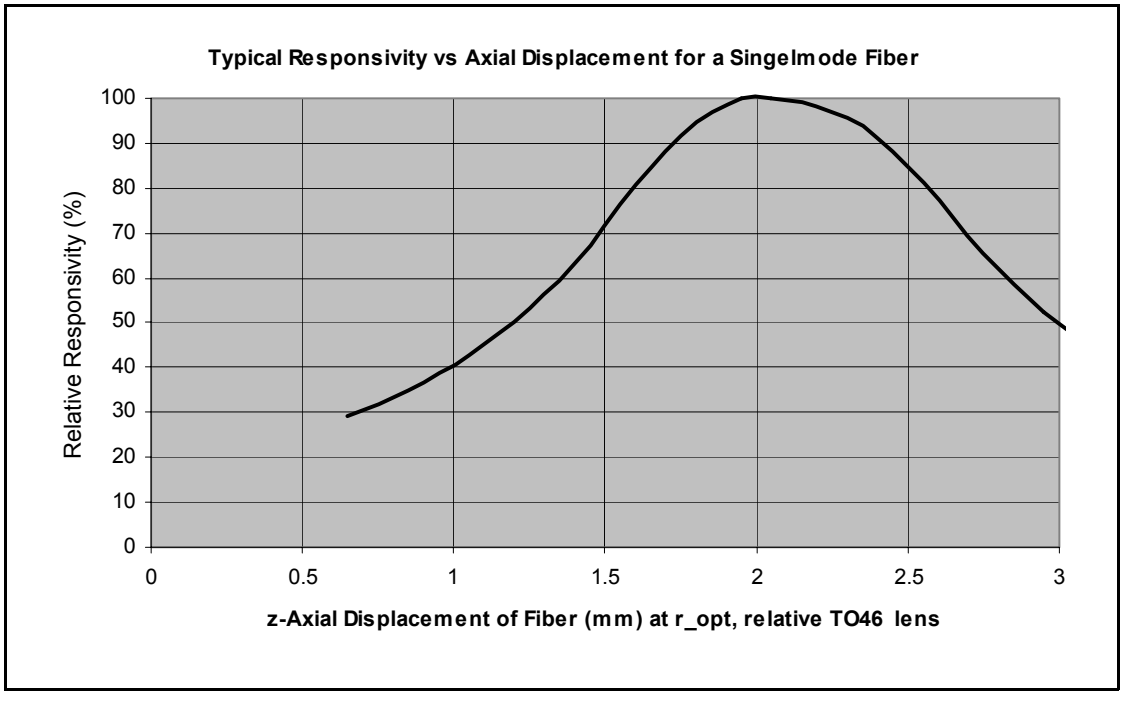


Figure 3 - Typical Responsivity vs Axial Displacement for a Singlemode Fiber

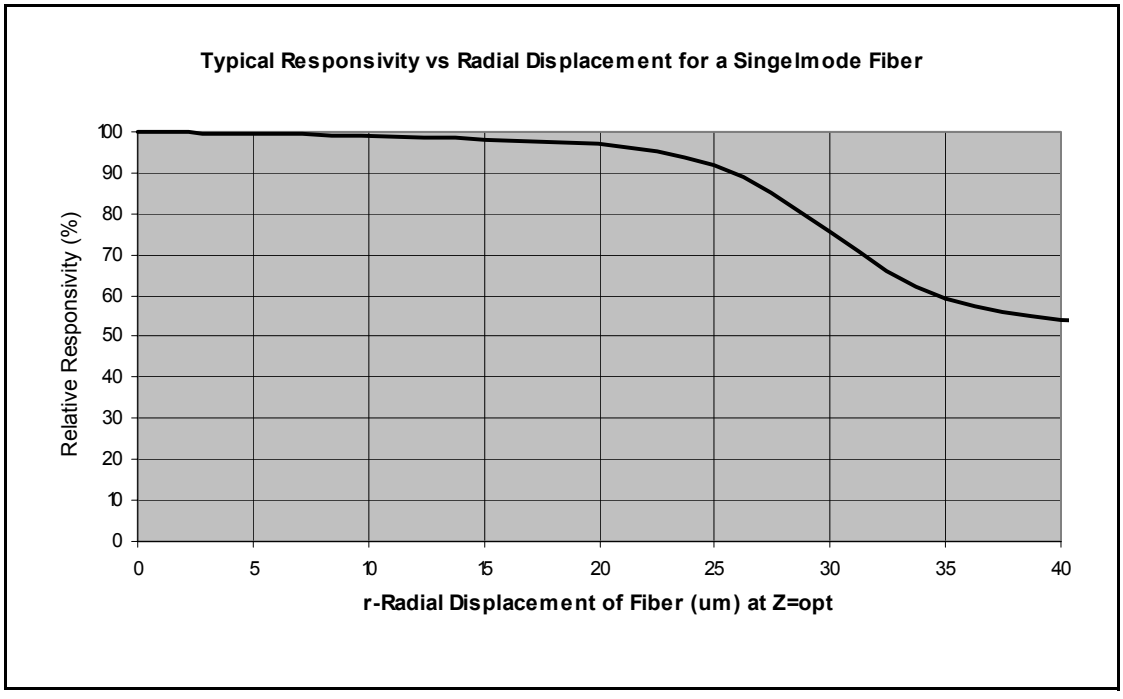


Figure 4 - Typical Responsivity vs Radial Displacement for a Singlemode Fiber

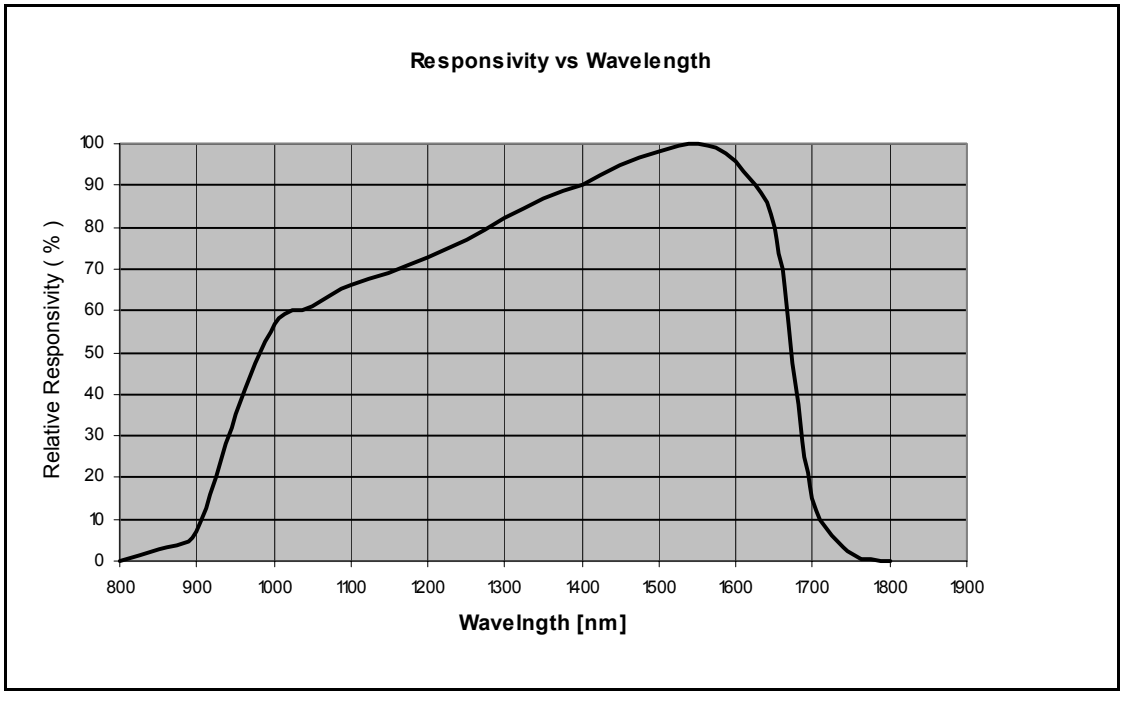


Figure 5 - Responsivity vs Wavelength of Coupled Input Power

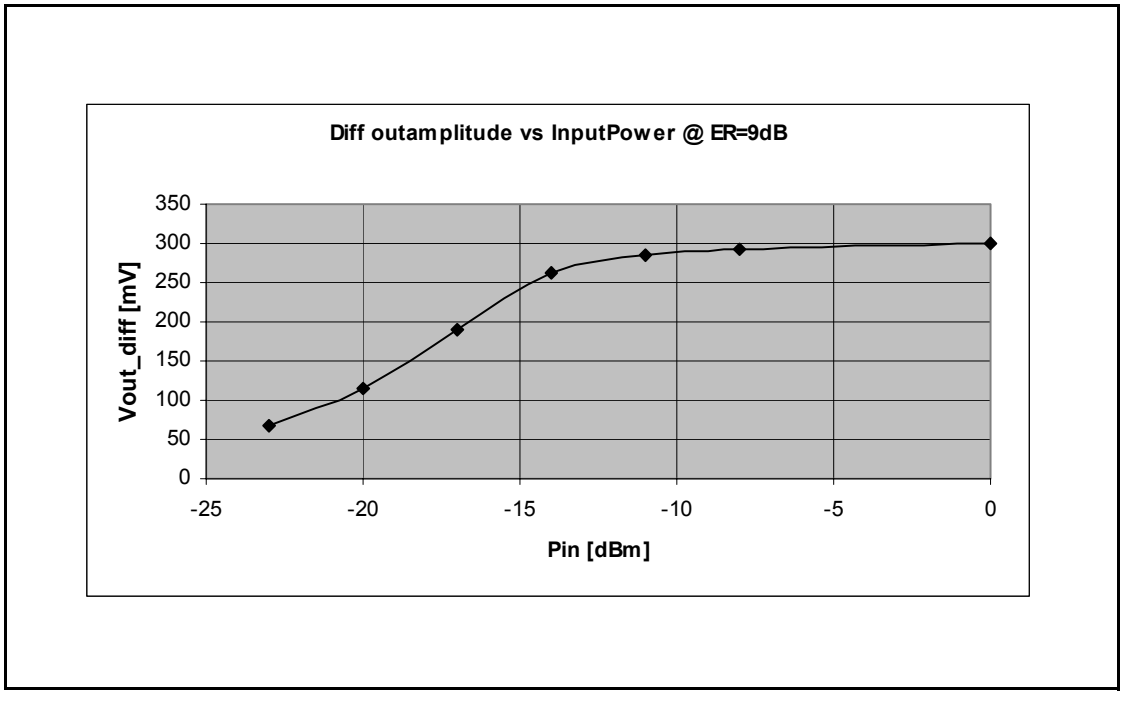


Figure 6 - Differential Out Amplitude vs Input Power

Application Guidelines

ESD handling

The receiver is sensitive to electrostatic discharges. When handling the device, precaution for ESD sensitive devices should be taken. These precautions include use of ESD protected work area with wrist straps, controlled work benches, floors etc.

Power Supply Filter

Power Supply decoupling capacitors are recommended for optimal performance of the receiver. A filter is recommended to minimize power supply noise. See Figure 7.

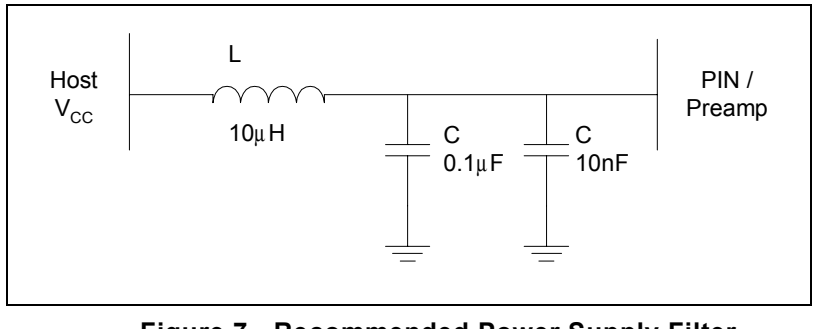


Figure 7 - Recommended Power Supply Filter

Data Outputs

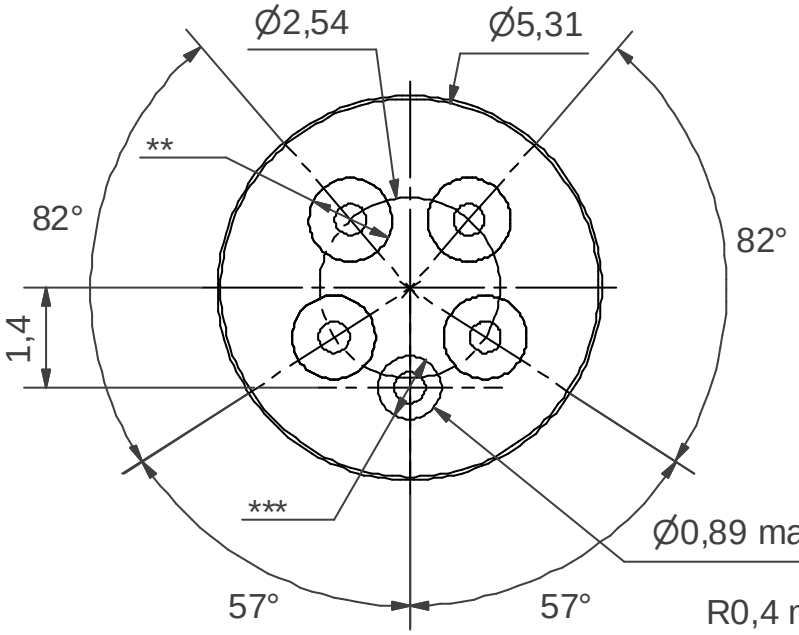
Outputs, Data and $\overline{\text{Data}}$, need to be AC-coupled. Typical value for the capacitors are 0.1µF.

Monitor

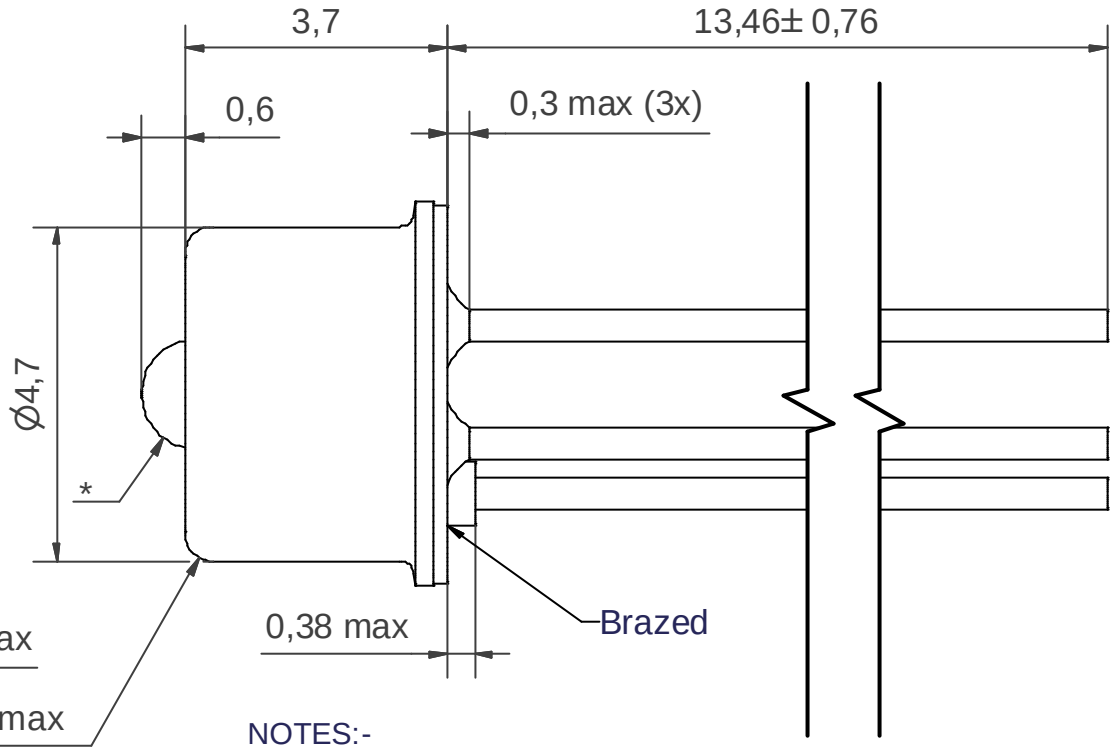
The Monitor pin is a current sink output signal which is proportional to the optical input power. The current flows into the pin.

To convert this current to a voltage a resistor to VCC should be used. Note that for linearity, ensure that the monitor pin in always >1 V, when it is used.

BOTTOM VIEW (10 : 1)



SIDE VIEW



* Lens Ø1.5 ± 0.05

** Glass sealing (4x): Ø1,17 +0.05

*** Lead (5x): Ø0,44 +0.05/-0,025

NOTES:-

1. All dimensions in mm.
2. General tol. ISO-2768-mK.
3. Coating: Case: Ni 1,5-2,5 µm.
   Header: Ni 2-3 µm / Au min 0.8 µm.

ISSUE	1			
ACN	JS004172R1A			
DATE	29-APR-03			
APPRD.	TD/BE			

ZARLINK SEMICONDUCTOR

Previous package codes

Package code TB

Drawing type
Package drawing, TO-46 with lens

Title JS004172

For more information about all Zarlink products
visit our Web Site at

www.zarlink.com

TECHNICAL DOCUMENTATION - NOT FOR RESALE