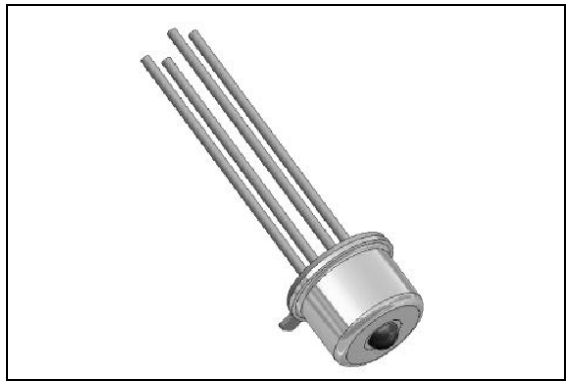
ZL60012

1310 nm, 1550 nm 270 Mbps PIN Preamplifier for SDI Digital Television

Data Sheet

December 2003



Ordering Information

ZL60012TBD TO-46 with lens

-40°C to +85°C

Features

- Data rate up to 270 Mbps
- 1310 nm, 1550 nm PIN
- TIA with AGC
- Handles DC-unbalanced signals
- Wide dynamic range
- TO-46 assembly
- 3.3 V power supply
- SMF and MMF

Applications

ANSI/SMPTE 259M

Description

This optical receiver is designed for SDI (Serial Digital Interface) digital television transmission systems where optical fiber replaces coaxial cable, to increase transmission distance. It is designed in conjunction with the ANSI/SMPTE 259 M standard and is capable of handling DC-unbalanced (pathological) signals.

The receiver operates at 3.3 V and contains an InGaAs PIN photodiode and a transimpedance amplifier with AGC (Automatic Gain Control), assembled in a TO-46 package. Its double-lens optical system is designed for use with single-mode fiber as well as multi-mode fiber with a core diameter up to 62.5 µm. Reliability assurance is based on Telecordia GR-468-CORE.

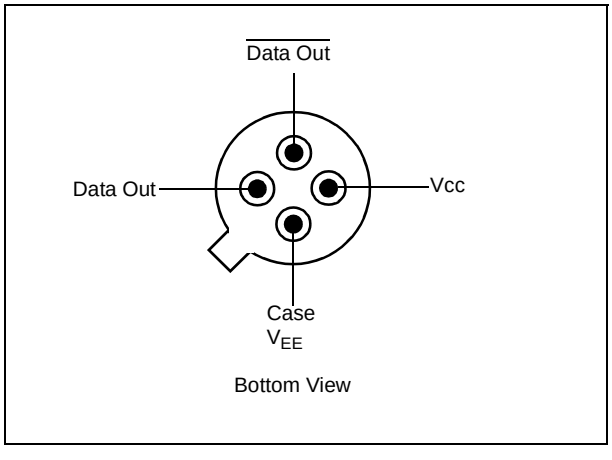


Figure 1 - Pin Diagram

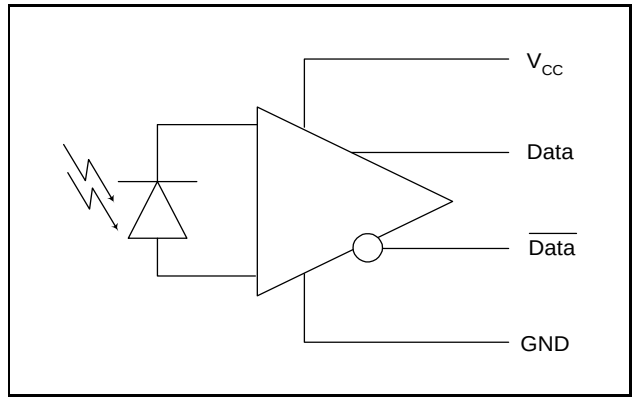


Figure 2 - Functional Schematic

Optical and Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Responsivity, differential	R	10	30	50	kV/W	λ = 1310 nm R_L = 100Ω, Note 1
Output Voltage differential amplitude	ΔV_O		130		mV, p-p	R_L = 100 Ω Note 2
Data rate	f_R			270	Mbps	R_L = 100 Ω
Optical Saturation Level (average)	P_{sat}		0		dBm	λ = 1310 nm, ER = ∞ Note 5
Noise-Equivalent Power	NEP		-45		dBm	λ = 1310 nm
Dynamic Range			32		dB	
Sensitivity (BER10^{-9})	S_{OMA}		1.2	2.5	µW	λ = 1310 nm, Note 3 and 4
Sensitivity (BER10^{-9})	S		-32	-29	dBm	λ = 1310 nm, ER = ∞ Note 5
Output Resistance (single-ended)	R_O	36	44	57	Ω	
Power Dissipation	P_D			180	mW	
Power Supply Current	I_{DD}	20	35	50	mA	

Test conditions: 25°C Case Temperature/3.3 V Supply Voltage. Fiber: Single-mode to multi-mode 62.5/125 µm

Note 1: Pf = 2 µW Peak-Peak power at 10 MHz/50% duty cycle.
Note 2: Pf = 500 µW Peak-Peak power at 10 MHz/50% duty cycle.
Note 3: Measured using DC-unbalanced patterns with 5% and 95% duty cycles, respectively at 270 Mbps.
Note 4: An OMA value has been quoted as this is more meaningful for DC unbalanced signals.
Note 5: Measured with a DC balanced signal with a 2^{23}-1 PRBS at 270 Mbps.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	V_{CC}	-0.5	5.5	V
Storage Temperature	T_{stg}	-55	125	°C

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max	Unit
Supply Voltage	V_{CC}	3		5.5	V
Output Differential Load	R_L		100		Ω
Operating Temperature	T_{op}	-40		85	°C

Typical Responsivity

		Fiber Core/Cladding Diameter Numerical Aperture		
	Wavelength	**10/125 NA = 0.11**	**50/125 NA = 0.20**	**62.5/125 NA = 0.275**
Differential responsitivity	1310 nm	30 kV/W	30 kV/W	30 kV/W
Differential responsitivity	1550 nm	36 kV/W	36 kV/W	36 kV/W

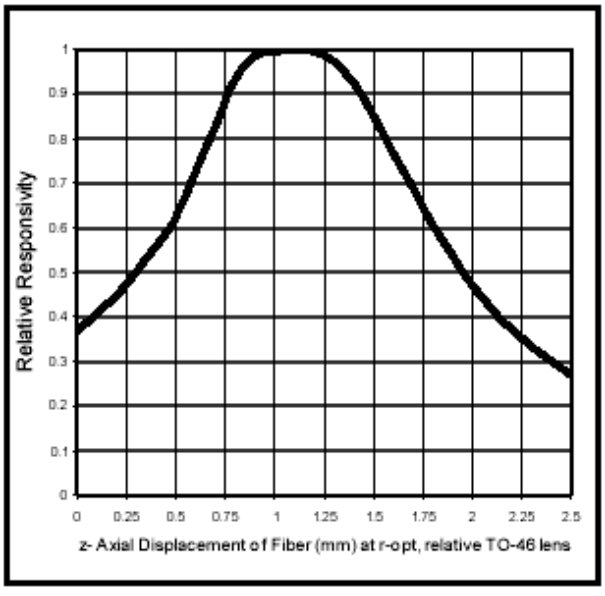


Figure 3 - Typical Responsivity vs Axial Displacement for a Multi-mode Fiber

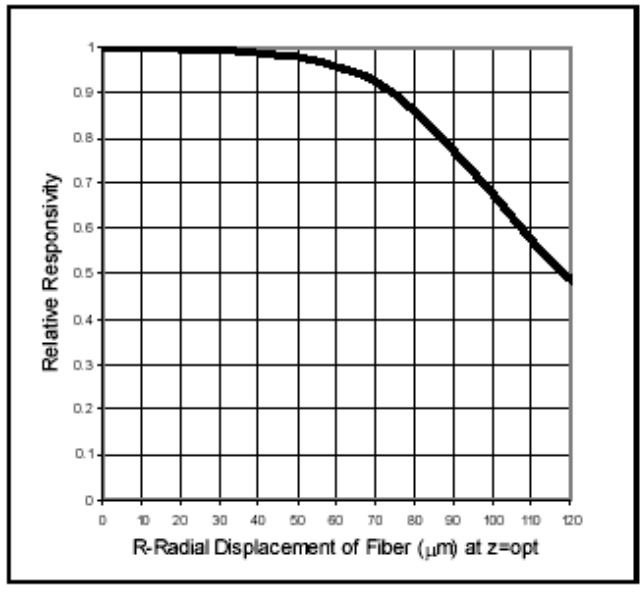


Figure 5 - Typical Responsivity vs Radial Displacement for a Multi-mode Fiber

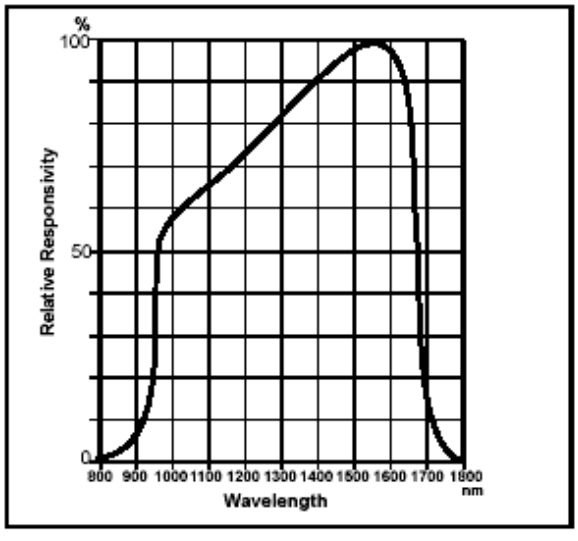


Figure 4 - Responsivity vs. Wavelength of Coupled Input Power

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 minimise power supply noise. See Figure 6.

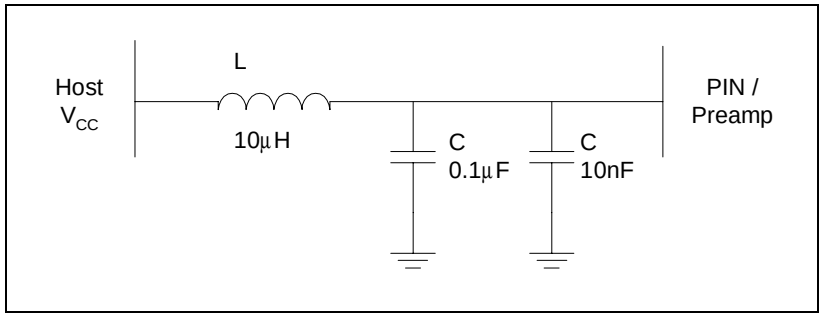
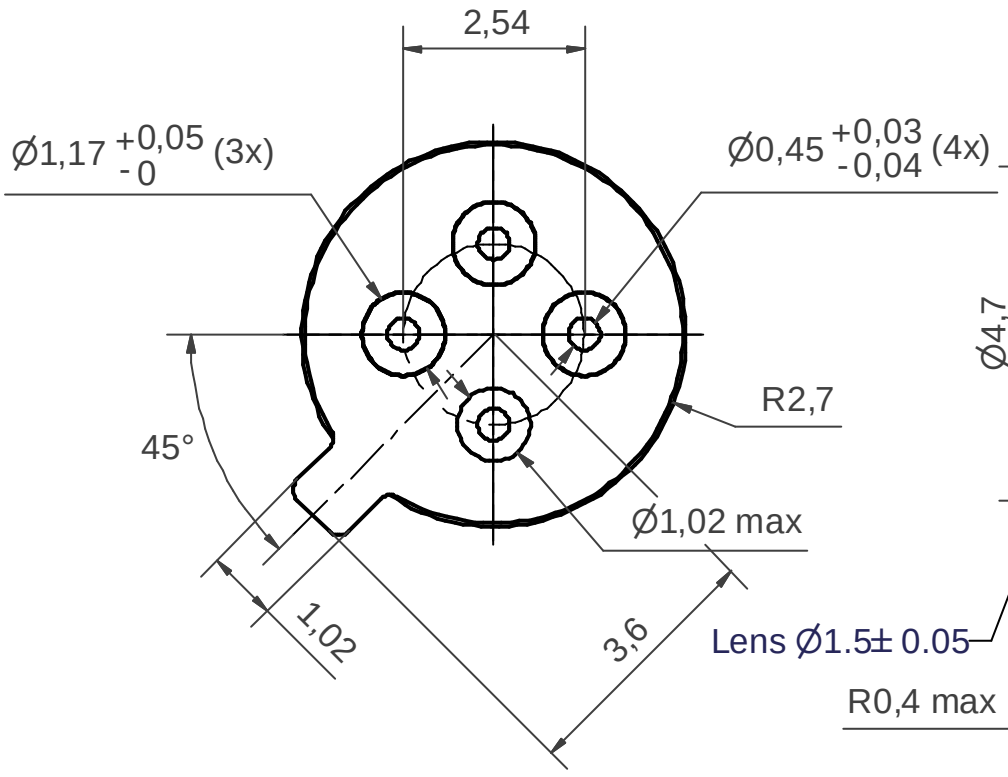
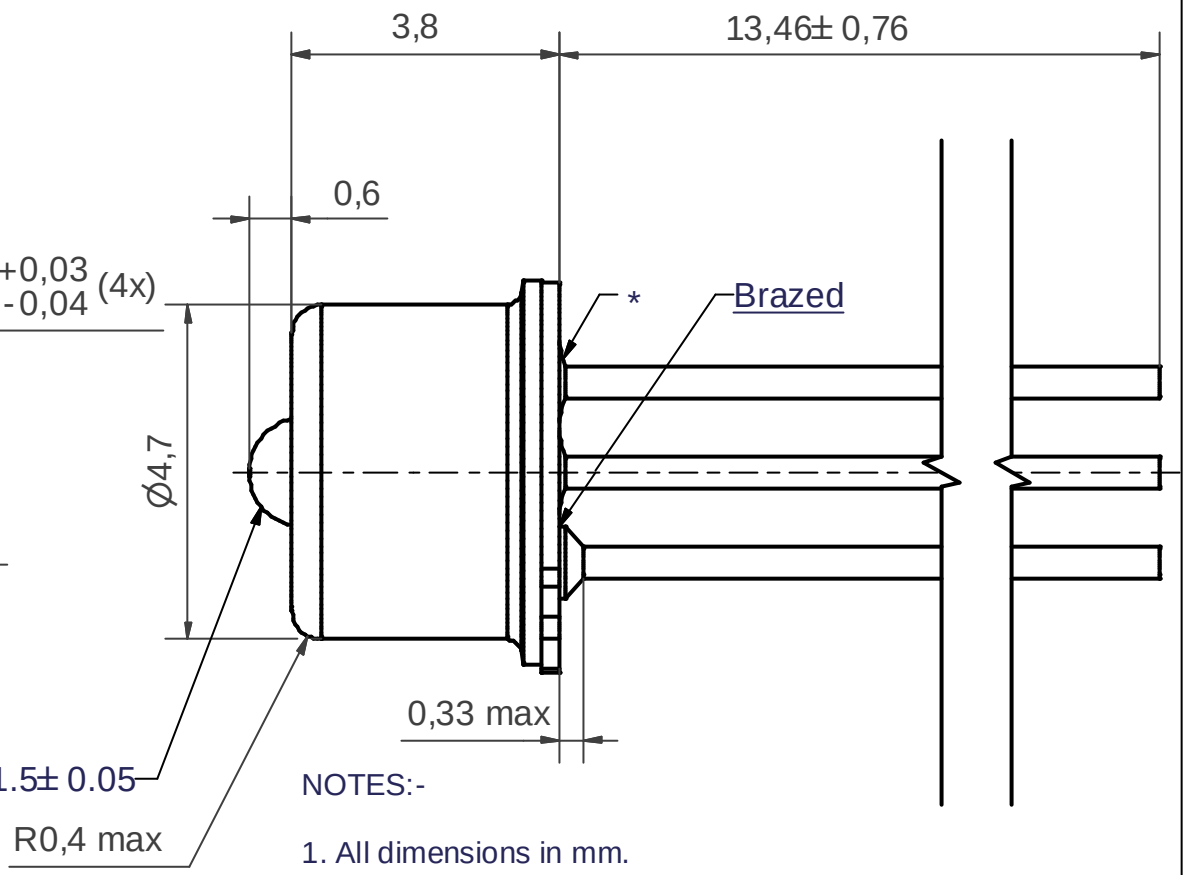


Figure 6 - Recommended Power Supply Filter

BOTTOM VIEW (10 : 1)



SIDE VIEW



NOTES:-

1. All dimensions in mm.
2. General tol. ISO-2768-mK.
3. Coating: Case: Ni 1,5-2,5 µm.
   Header: Ni min 0,5 µm / Au min 1,5 µm.

* 0,25 max glass overmould (3x)

ISSUE	1			
ACN	JS004078R1A			
DATE	22-MAR-03			
APPRD.	TD/BE			

ZARLINK SEMICONDUCTOR

Previous package codes

Package code TB

Drawing type
Package drawing, TO-46 with lens

Title JS004078

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