

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

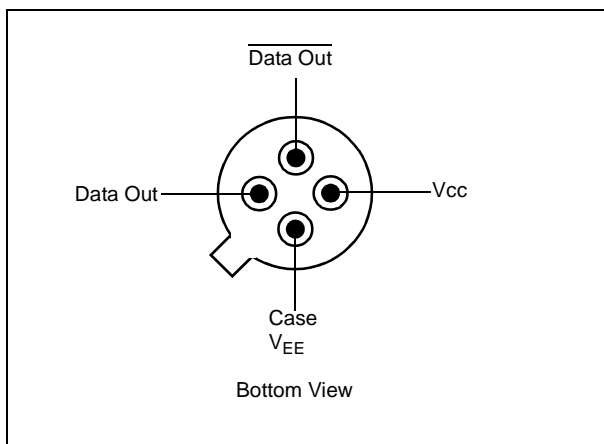
### Description

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.

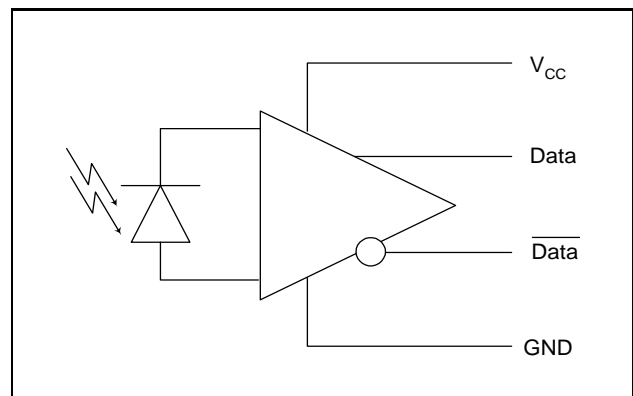
The receiver operates at 3.3 V and contains an InGaAs PIN photodiode and a transimpedance amplifier with AGC (Automatic Gain Control), assembled in a TO-46 package. Its double-lens optical system is designed for use with single-mode fiber as well as multi-mode fiber with a core diameter up to 62.5 μm.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

### Applications

ANSI/SMPTE 259M



**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	$\lambda = 1310$ nm $R_L = 100\Omega$ , Note 1
Output Voltage differential amplitude	$\Delta V_O$		130		mV, p-p	$R_L = 100 \Omega$ Note 2
Data rate	$f_R$			270	Mbps	$R_L = 100 \Omega$
Optical Saturation Level (average)	$P_{sat}$		0		dBm	$\lambda = 1310$ nm, $ER = \infty$ Note 5
Noise-Equivalent Power	NEP		-45		dBm	$\lambda = 1310$ nm
Dynamic Range			32		dB	
Sensitivity (BER $10^{-9}$ )	$S_{OMA}$		1.2	2.5	$\mu W$	$\lambda = 1310$ nm, Note 3 and 4
Sensitivity (BER $10^{-9}$ )	$S$		-32	-29	dBm	$\lambda = 1310$ nm, $ER = \infty$ Note 5
Output Resistance (single-ended)	$R_O$	36	44	57	$\Omega$	
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  $\mu m$

Note 1:  $P_f = 2 \mu W$  Peak-Peak power at 10 MHz/50% duty cycle.

Note 2:  $P_f = 500 \mu W$  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**

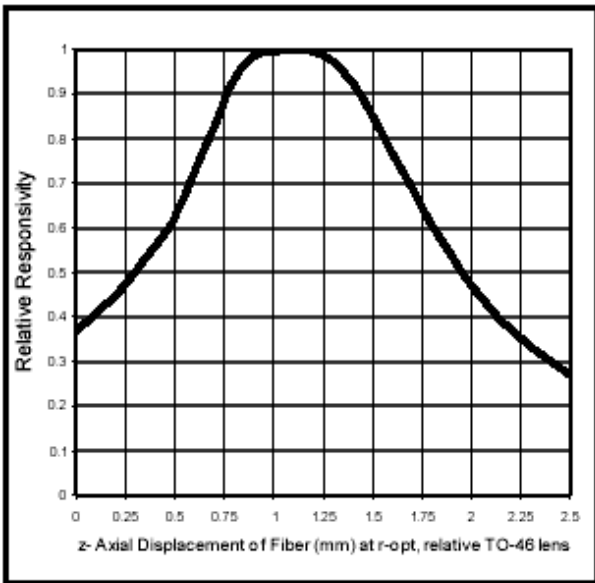
Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	$V_{CC}$	-0.5	5.5	V
Storage Temperature	$T_{stg}$	-55	125	$^{\circ}C$

**Recommended Operating Conditions**

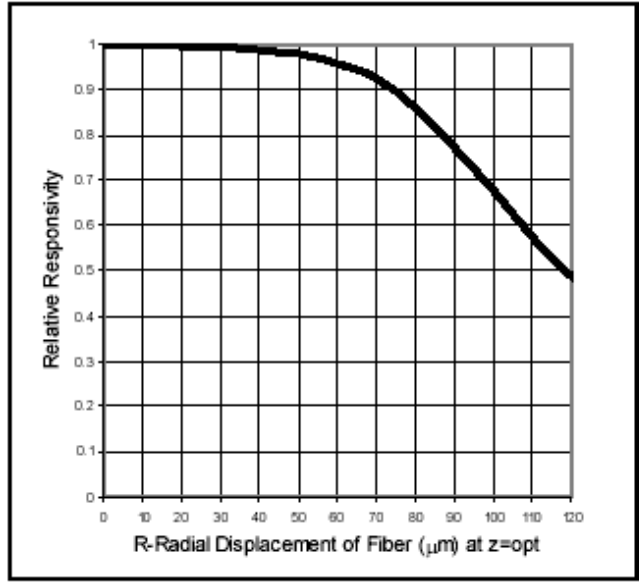
Parameter	Symbol	Min.	Typ.	Max	Unit
Supply Voltage	$V_{CC}$	3		5.5	V
Output Differential Load	$R_L$		100		$\Omega$
Operating Temperature	$T_{op}$	-40		85	$^{\circ}C$

**Typical Responsivity**

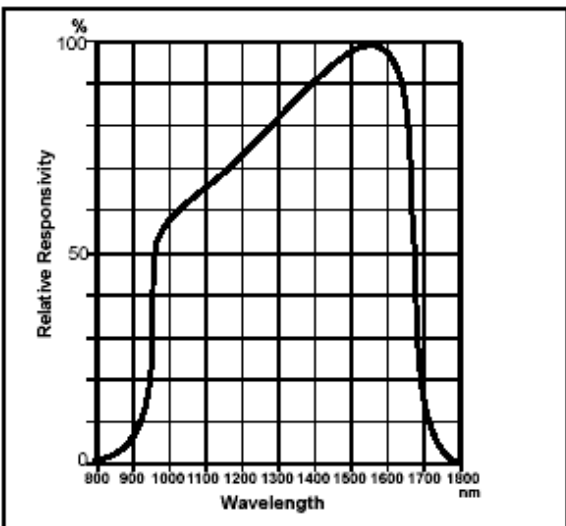
		Fiber Core/Cladding Diameter Numerical Aperture		
	Wavelength	10/125 NA = 0.11	50/125 NA = 0.20	62.5/125 NA = 0.275
Differential responsivity	1310 nm	30 kV/W	30 kV/W	30 kV/W
Differential responsivity	1550 nm	36 kV/W	36 kV/W	36 kV/W



**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

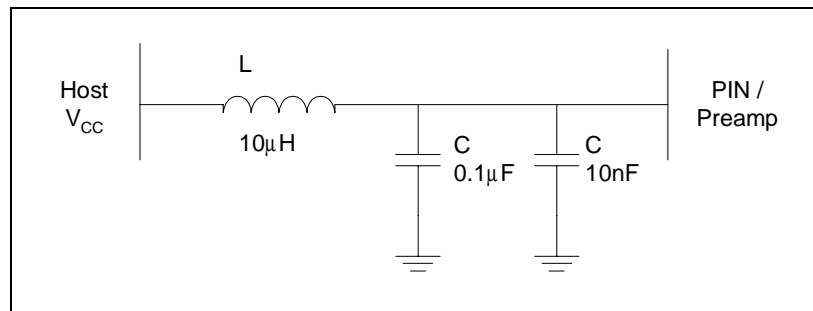


### ESD Handling

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.

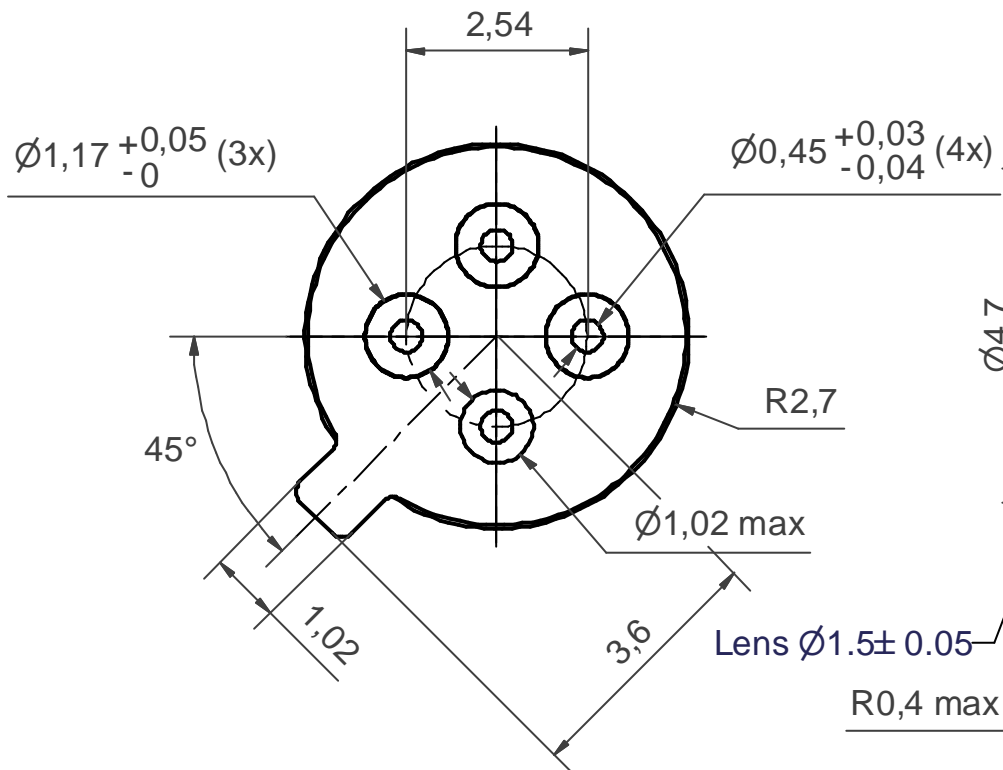
### Power Supply Filter

Power Supply decoupling capacitors are recommended for optimal performance of the receiver. A filter is recommended to minimise power supply noise. See Figure 6.

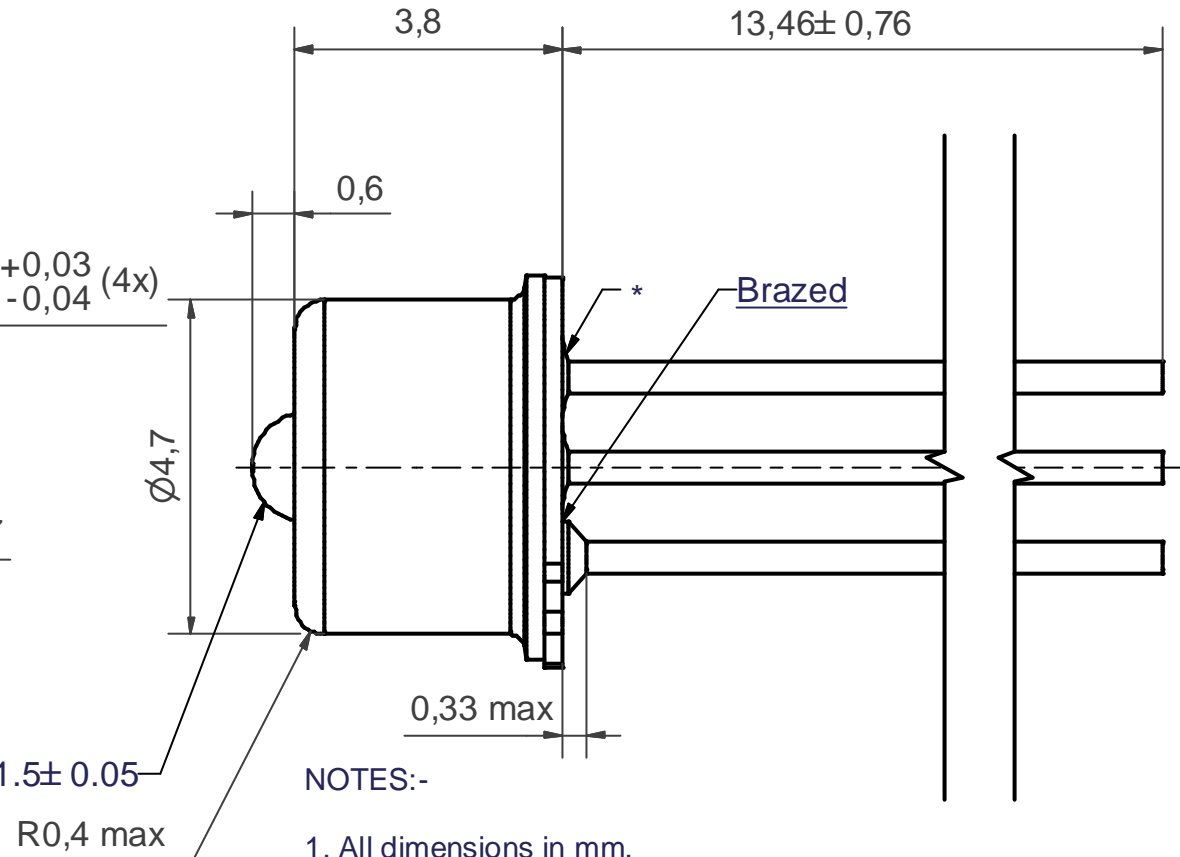


**Figure 6 - Recommended Power Supply Filter**

# 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  $\mu$ m.  
Header: Ni min 0,5  $\mu$ m / Au min 1,5  $\mu$ m.

\* 0,25 max glass overmould (3x)

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