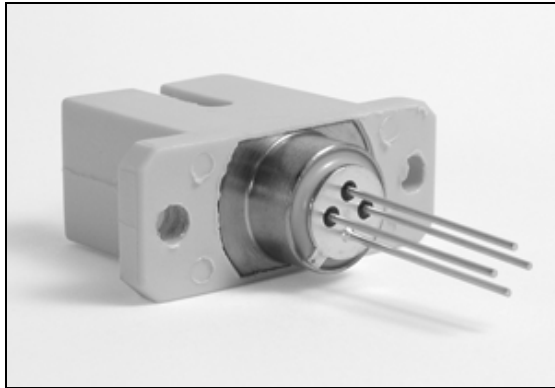


December 2003



### Ordering Information

ZL60013TED, TO-46 with lens in SC-housing

**-40°C to +85°C**

### Description

This optical receiver is designed for SDI (Serial Digital Interface) HDTV (high definition television) optical fiber transmission systems. The product follows the ANSI/SMPTE 292 M standard and is capable of handling DC-unbalanced (pathological) signals.

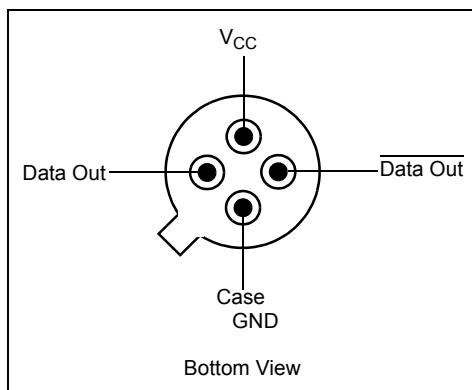
The receiver operates at 3.3 V and contains an InGaAs PIN photodiode and a transimpedance amplifier with AGC (Automatic Gain Control), assembled in a TO-46 package. Its double-lens optical system is designed for use with single-mode fiber as well as multi-mode fiber with a core diameter up to 62.5 μm. Reliability assurance is based on Telecordia GR-468-CORE. The product is supplied in SC-housing as standard as defined by ANSI/SMPTE 292 M standard.

### Features

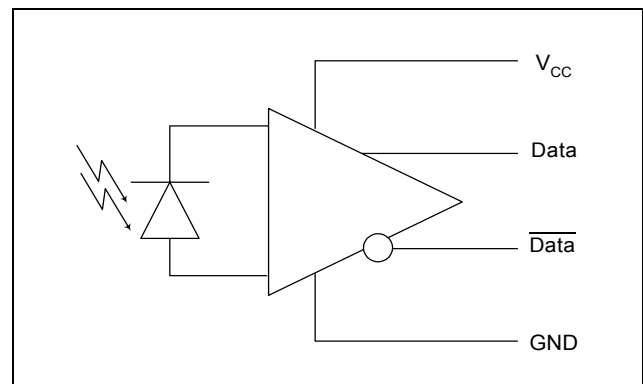
- Data rate up to 1.5 Gbps
- 1310 nm, 1550 nm PIN
- TIA with AGC
- Handles DC-unbalanced signals
- Wide dynamic range
- TO-46 assembly
- 3.3 V power supply
- SMF and MMF

### Applications

- ANSI/SMPTE 292M



**Figure 1 - Pin Diagram**



**Figure 2 - Functional Schematic**

**Optical and Electrical Characteristics**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Responsivity, differential	$R$	4	8	12	kV/W	$\lambda = 1310$ nm $R_L = 100 \Omega$ , Note 1
Output Voltage amplitude differential	$\Delta V_O$		400		mV, p-p	$R_L = 100 \Omega$ Note 2
Data rate	$f_R$			1.5	Gbps	$R_L = 100 \Omega$
Optical Saturation Level (average)	$P_{sat}$		-2		dBm	$\lambda = 1310$ nm, $E_R = \infty$ Note 5
Noise-Equivalent Power	NEP		-36		dBm	$\lambda = 1310$ nm
Sensitivity (BER $10^{-9}$ )	$S_{OMA}$		5	10	$\mu$ W	$\lambda = 1310$ nm, Note 3 and 4
Sensitivity (BER $10^{-9}$ )	$S$		-26	-23	dBm	$\lambda = 1310$ nm, $E_R = \infty$ Note 5
Dynamic Range			24		dB	
Output Resistance (single-ended)	$R_O$		50		$\Omega$	
Power Supply Current	$I_{DD}$		34	47	mA	
Power Dissipation				169	mW	

**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 1.48 Gbps.

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 1.48 Gbps.

**Absolute Maximum Ratings**

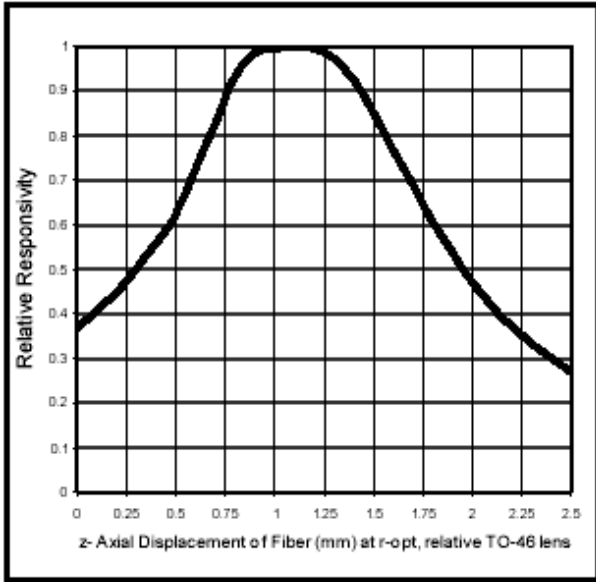
Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	$V_{CC}$	0	6	V
Storage Temperature	$T_{stg}$	-55	125	°C

**Recommended Operating Conditions**

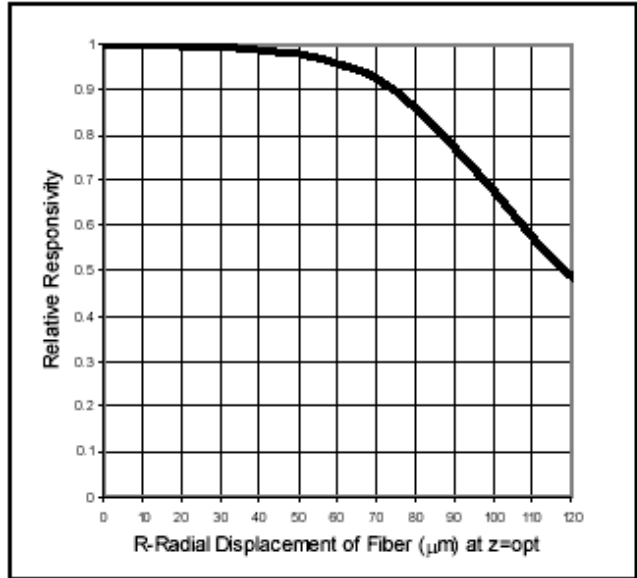
Parameter	Symbol	Min.	Typ.	Max	Unit
Supply Voltage	$V_{CC}$	3.0		5.5	V
Output Differential Load	$R_L$		100		$\Omega$
Operating Temperature	$T_{op}$	-40		85	°C

**Typical Responsivity**

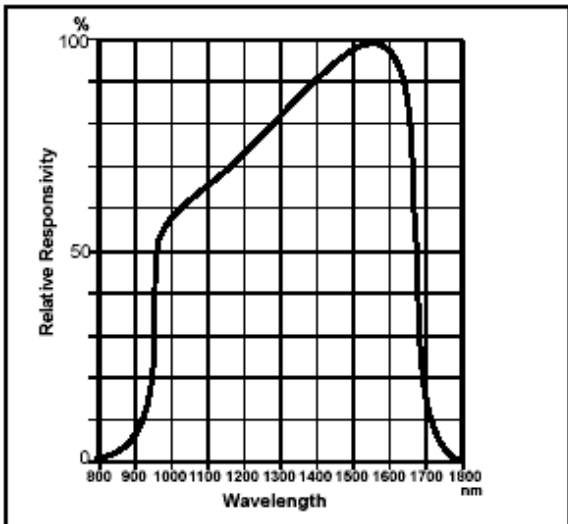
	Fiber Core/Cladding Diameter Numerical Aperture			
	Wavelength	10/125 NA = 0.11	50/125 NA = 0.20	62.5/125 NA = 0.275
Differential responsivity	1310 nm	8 kV/W	8 kV/W	8 kV/W
Differential responsivity	1550 nm	9.5 kV/W	9.5 kV/W	9.5 kV/W



**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

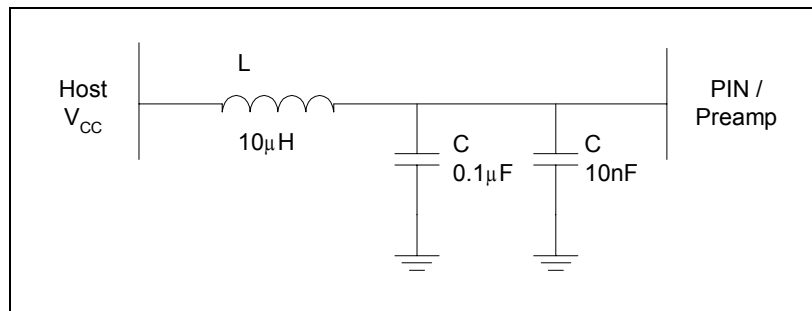


### ESD Handling

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.

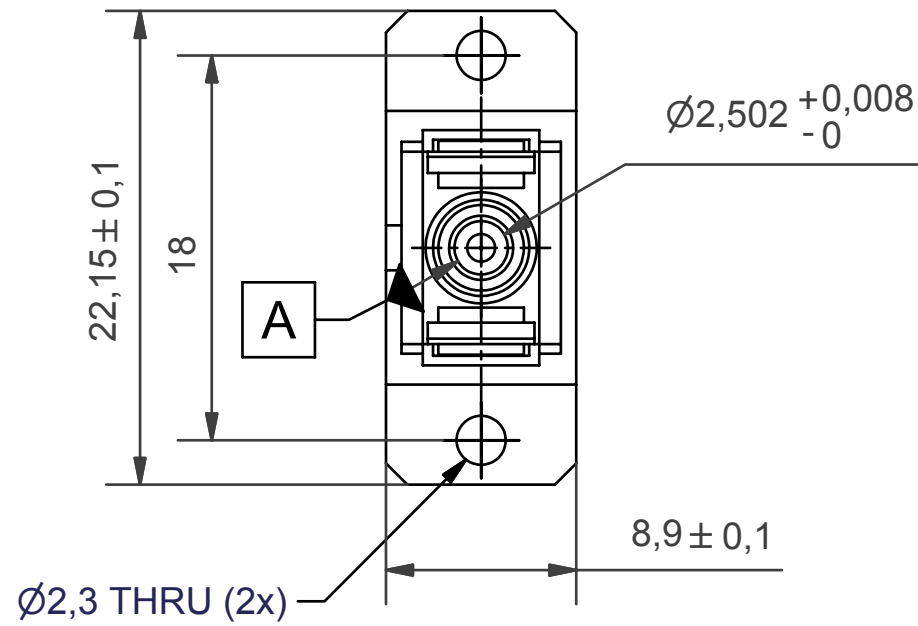
### Power Supply Filter

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

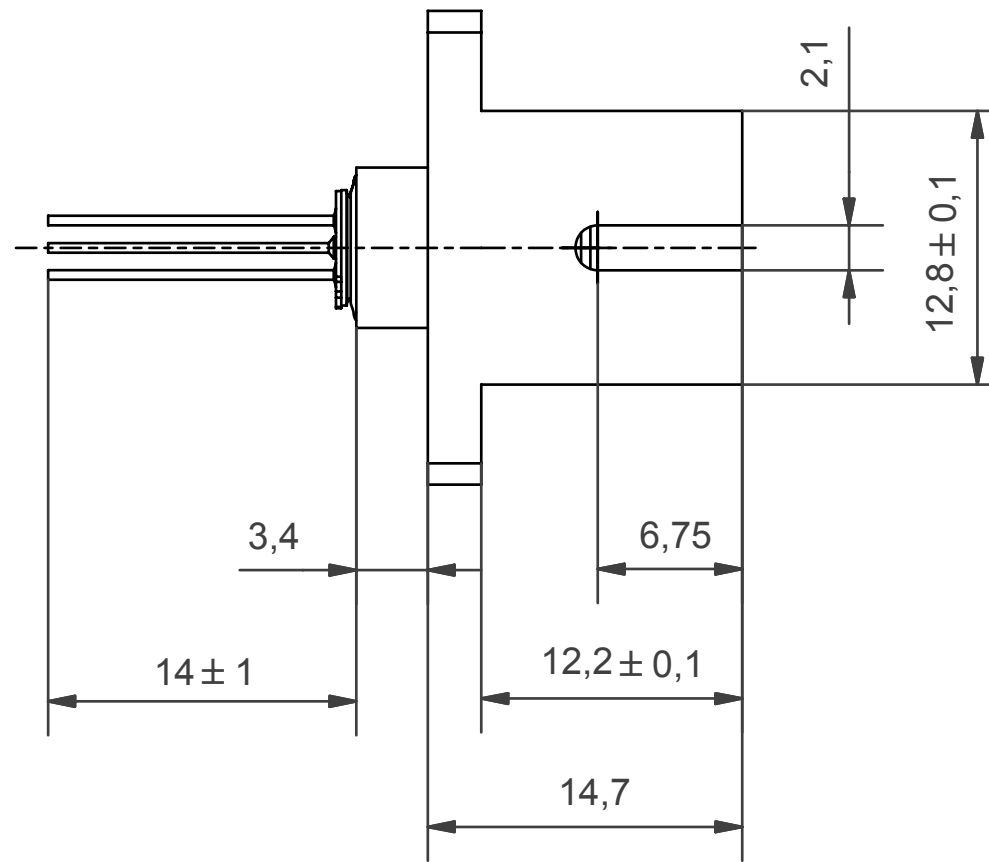


**Figure 6 - Recommended Power Supply Filter**

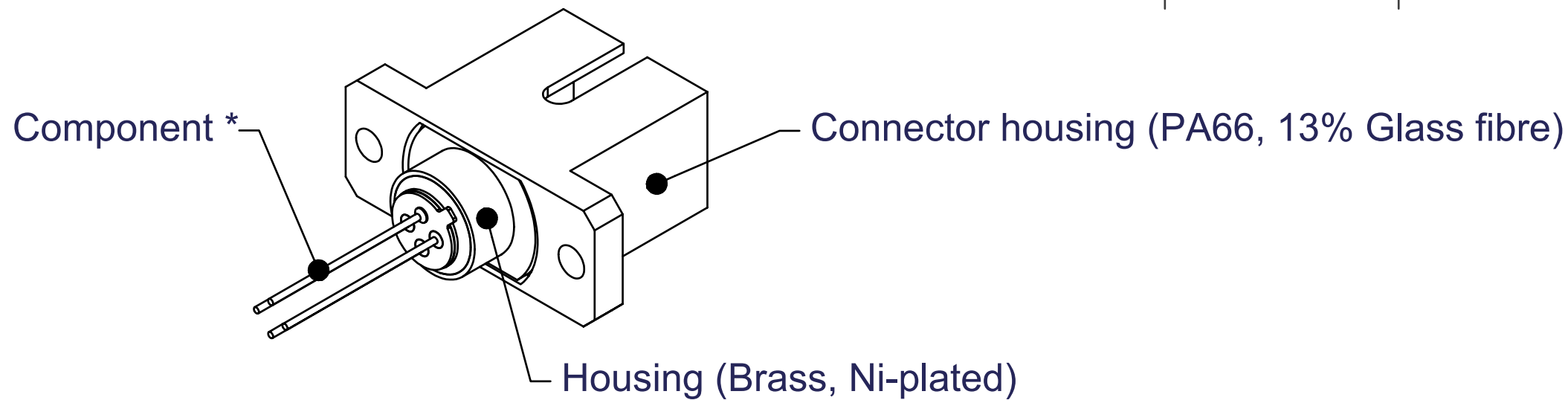
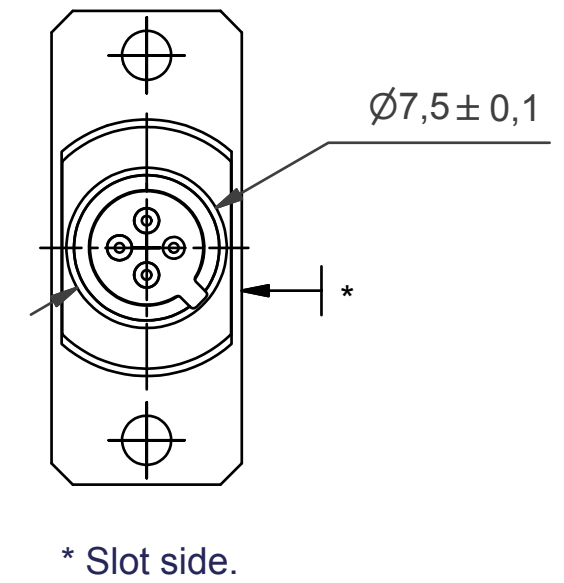
FRONT VIEW ( 2 : 1 )



SIDE VIEW



BOTTOM VIEW



NOTES:-

1. All dimensions in mm.
2. General tol. ISO-2768-mK.

\* For details of the component, see separate data sheet and/or package drawing.

Projection Method

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DATE	9-DEC-03			
APPRD.	MD/MA			



Package code	<b>TE</b>
Previous package codes	Drawing type TO-46 Package Outline in SC Connector housing
	Title <b>102546</b>



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