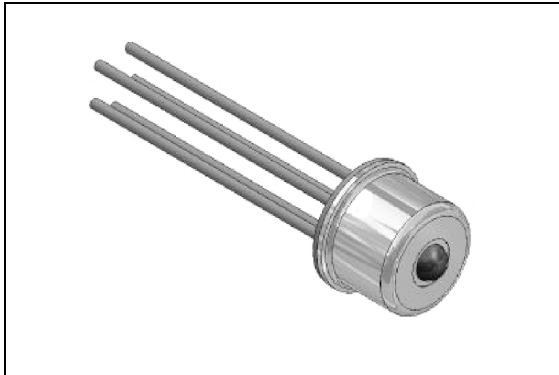


March 2004



Ordering Information

ZL60015TBD TO-46 with Lens

-40°C to +85°C

Features

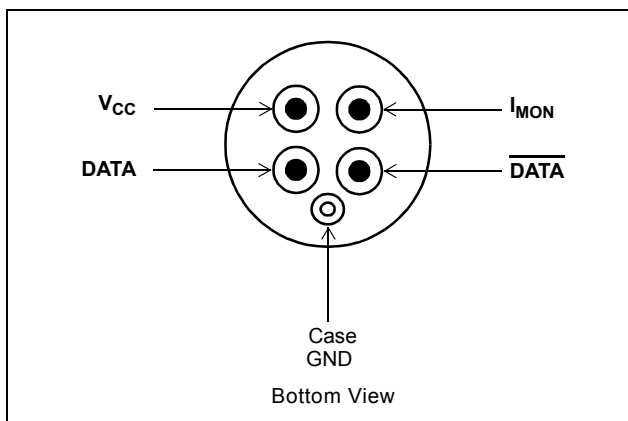
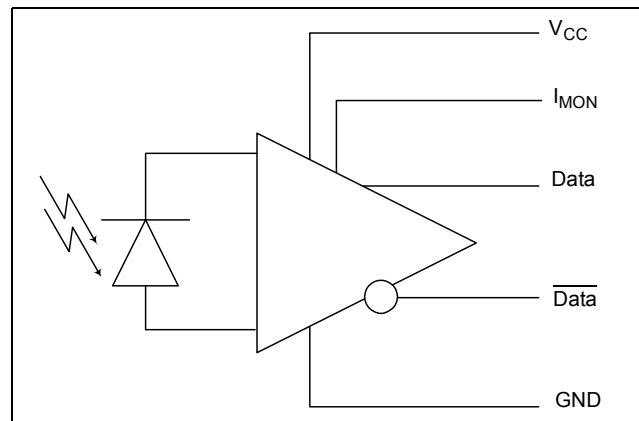
- Data rate up to 3.125 Gbps
- 1310 nm, 1550 nm PIN
- TO-46 Assembly
- Integrated TIA and limiting amplifier
- Single 3.3 V supply
- Differential Output
- Photocurrent monitor
- Low power consumption

Applications

- Sonet OC-48
- SDH STM-16
- 2.125 Gbps fiber channel
- 2.5 to 3.125 Gbps general application

Description

This optical receiver is a 3.3V 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.


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	$\lambda = 1310$ nm $R_L = 100 \Omega$, Note 1
Photo Monitor current	I_{mon}		0.8		A/W	$\lambda = 1310$ nm $R_L = 2000 \Omega$
Output Voltage, differential	ΔV_O	200	300		mV _{pp}	$R_L = 100 \Omega$, Note 2
Bandwidth (3dB _{el})	f_c		2.0		GHz	$P_f = 10 \mu\text{W}$, $R_L = 100 \Omega$
Optical Saturation level, (average)	P_{sat}	1			dBm	$\lambda = 1310$ nm $ER = \infty$, Note 3
Noise-Equivalent Power	NEP		-32	-30	dBm	$\lambda = 1310$ nm, Note 4
Sensitivity (BER 10^{-9})	S		-25	-23	dBm	$\lambda = 1310$ nm $ER = \infty$, Note 3, 5
Output Resistance (single)	R_O		50		Ω	
Power Dissipation	P_D		85	140	mW	
Power Supply Current	I_{DD}		25	38	mA	

Operating Conditions: 25°C Case Temperature/3.3 V Supply Voltage/Fiber: Single-mode fiber, Pattern PRBS 2²³-1 at 2.5 Gbps

Note 1: $P_f = 10 \mu\text{W}$ Peak-Peak Power

Note 2: $P_f = 500 \mu\text{W}$ Peak-Peak Power

Note 3: Measured at 10^{-9} BER with a 2²³-1 PRBS at 2.5 Gbps

Note 4: Measured with STM-16 filter on electrical output, e.g., 1.875 GHz

Note 5: Typical penalty at 10^{-10} BER equals 0.26dB

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}	3	3.3	3.6	V
Operating Temperature	T_{op}	-40		85	°C
Signalling Rate, Note 6	f_D	1	2.5	3.125	Gbps

Note 6: Data pattern are to have maximum runlength and DC-balance shifts of no more than that of a PRBS-23 pattern.

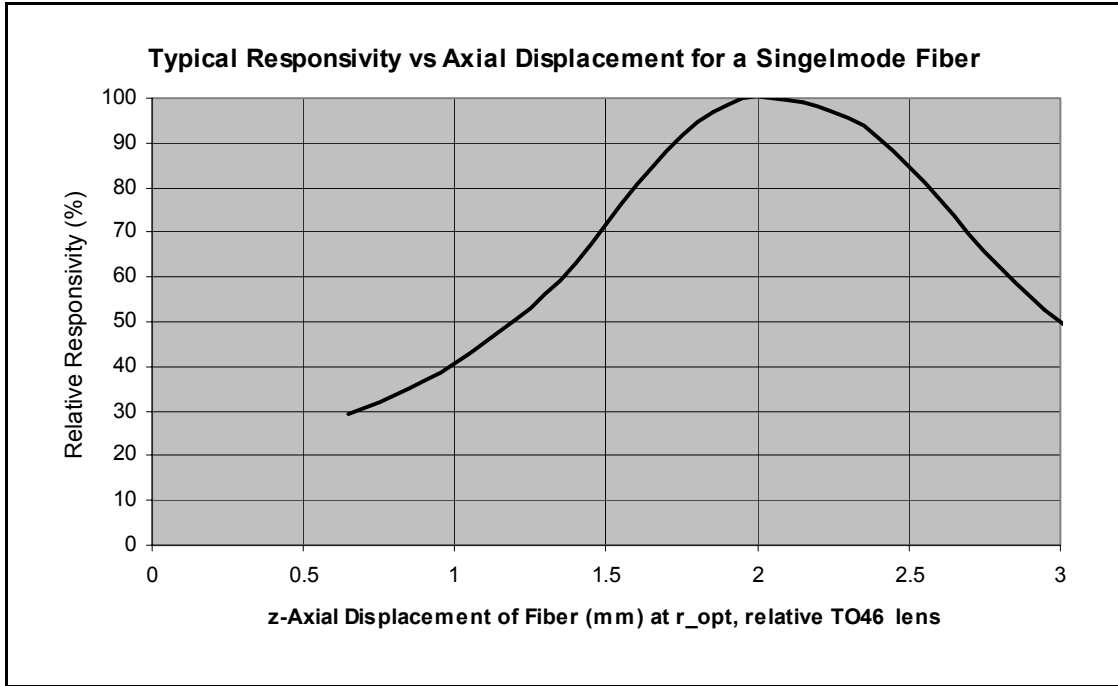


Figure 3 - Typical Responsivity vs Axial Displacement for a Singelmode Fiber

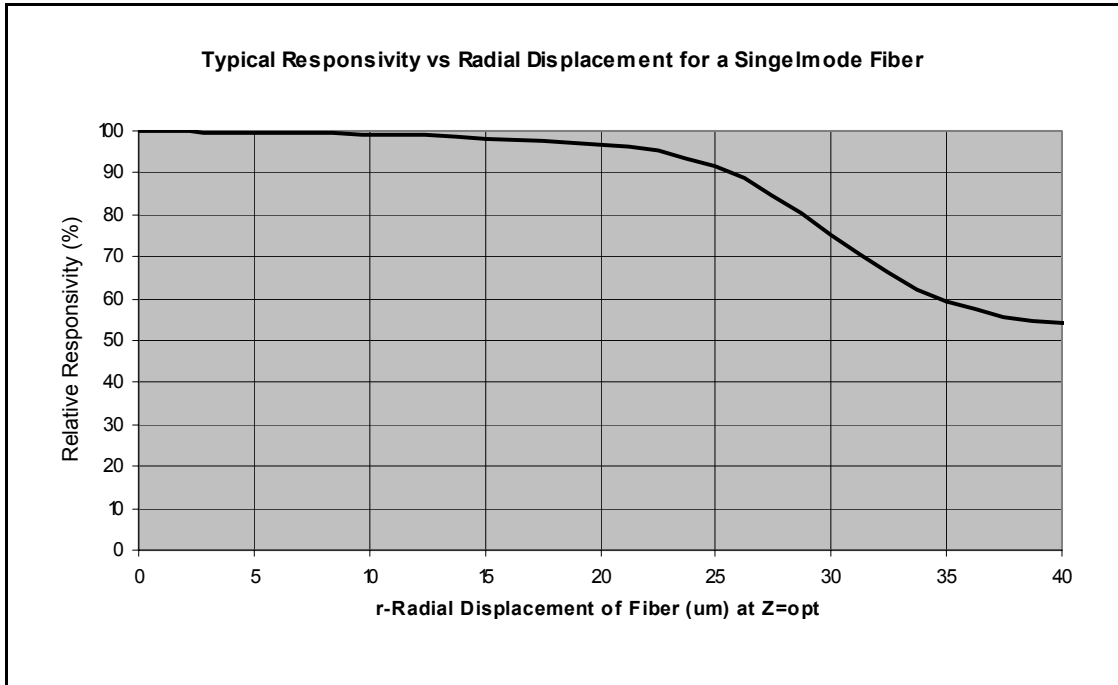


Figure 4 - Typical Responsivity vs Radial Displacement for a Singelmode Fiber

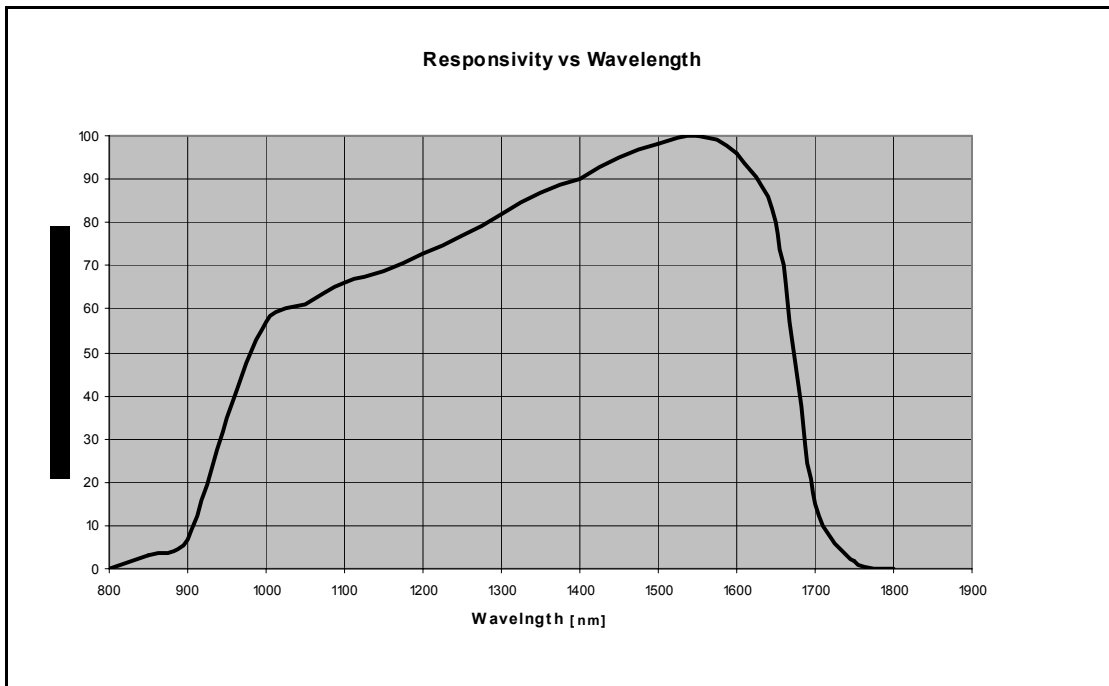


Figure 5 - Responsivity vs Wavelength of Coupled Input Power

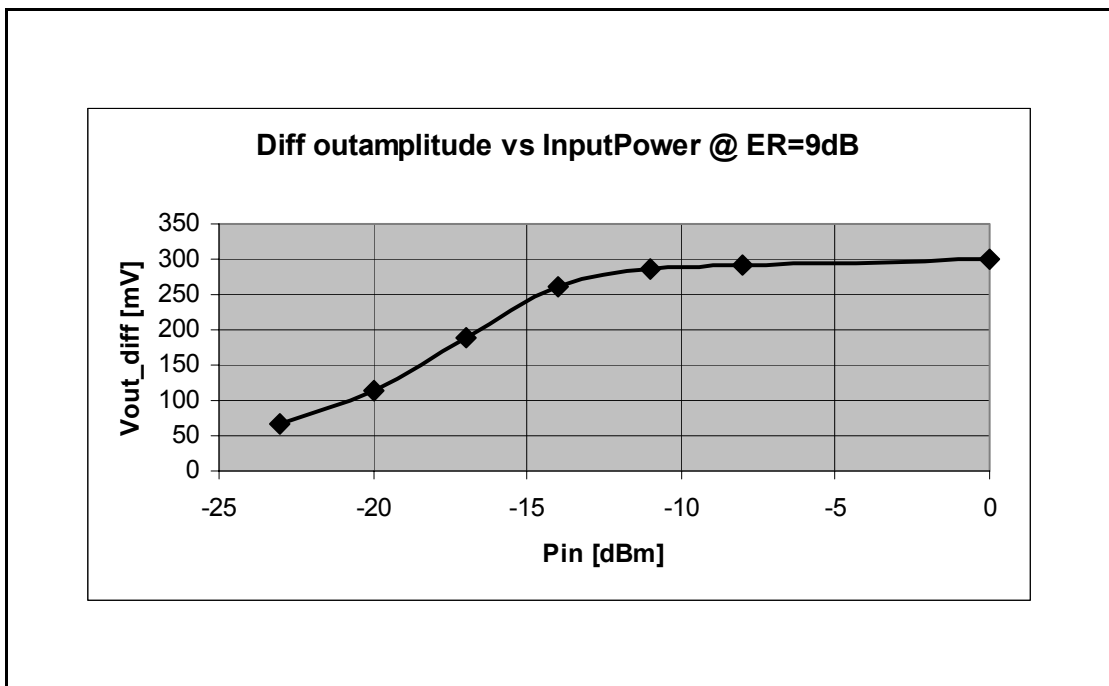


Figure 6 - Differential Out Amplitude vs Input Power

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.

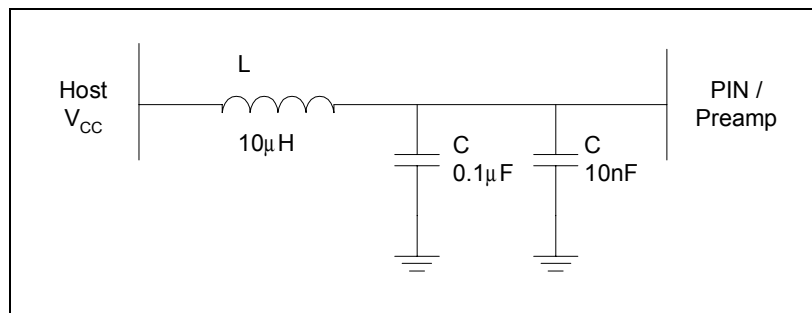


Figure 7 - Recommended Power Supply Filter

Data Outputs

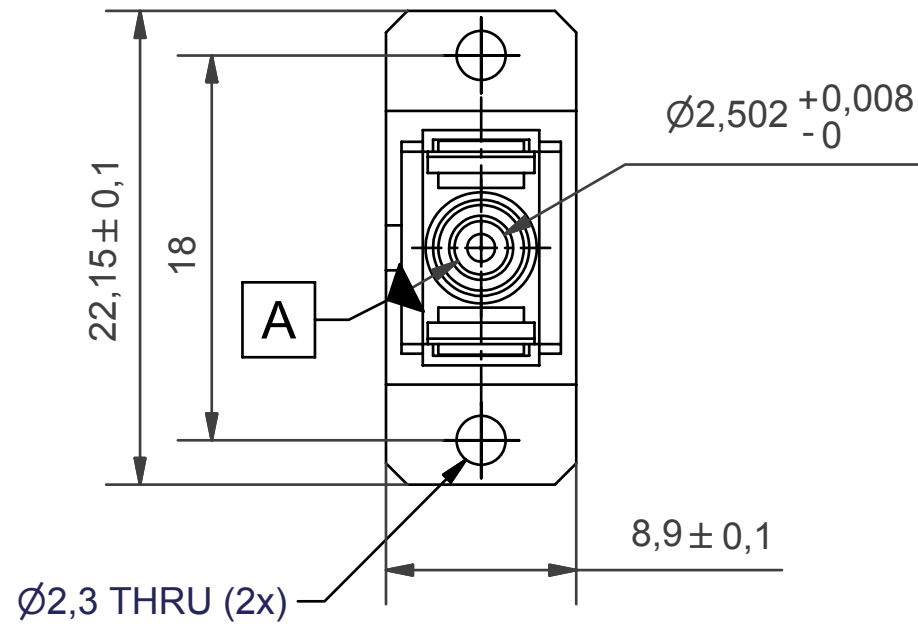
Outputs, Data and $\overline{\text{Data}}$, need to be AC-coupled. Typical value for the capacitors are 0.1 μF

Monitor

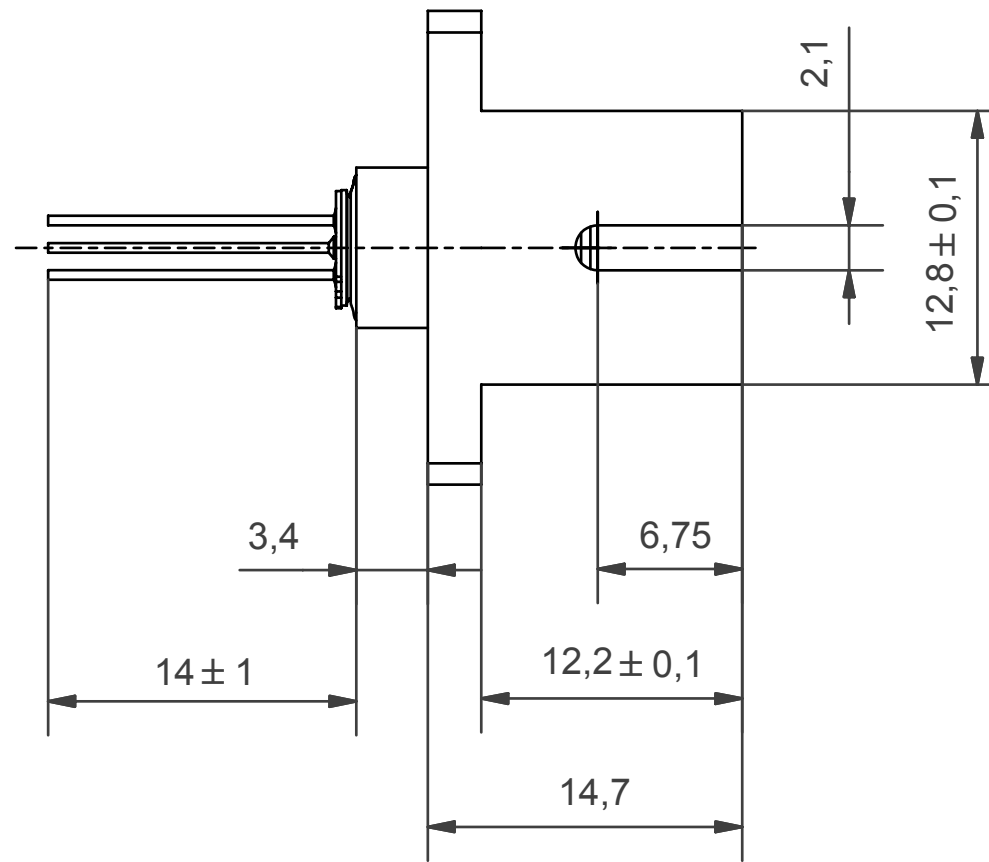
The Monitor PIN is a current sink output signal which is proportional to the optical input power. The current flows into the PIN.

To convert this current to a voltage a resistor to VCC should be used. Note that for linearity, ensure that the monitor pin is always $>1\text{ V}$.

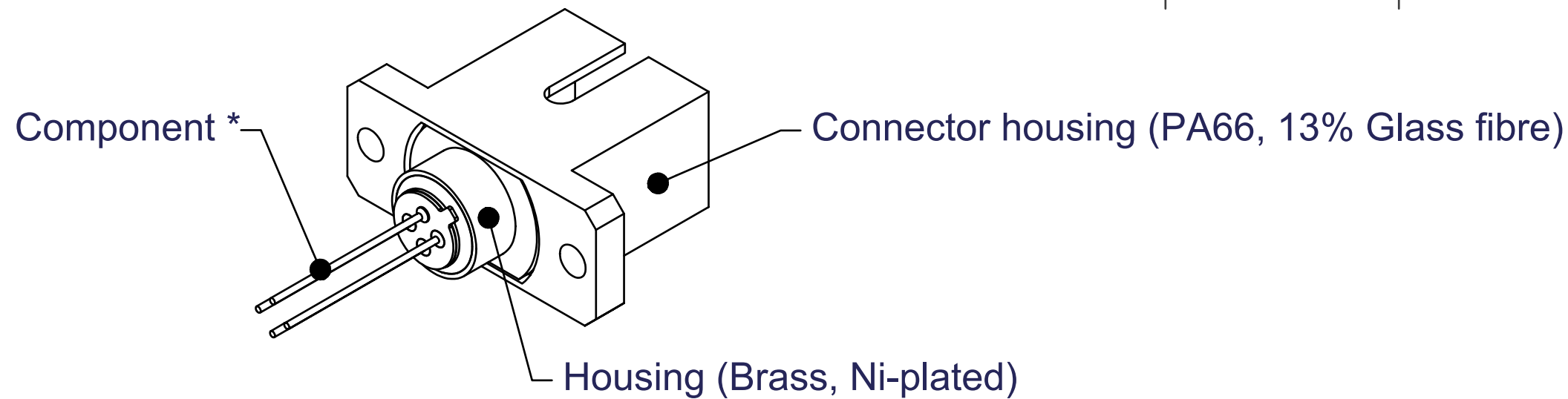
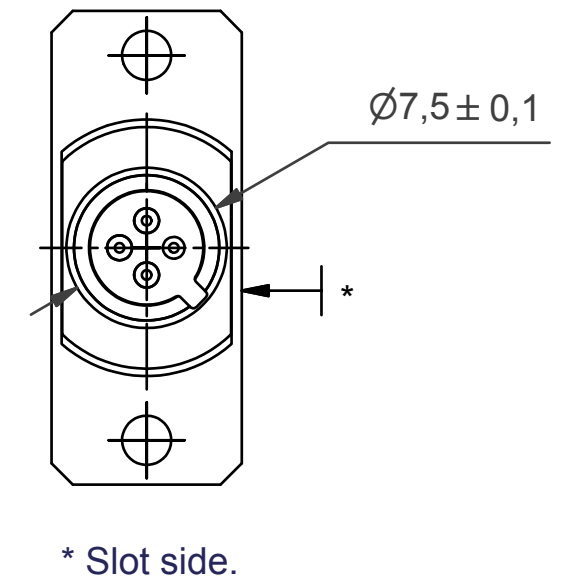
FRONT VIEW (2 : 1)



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

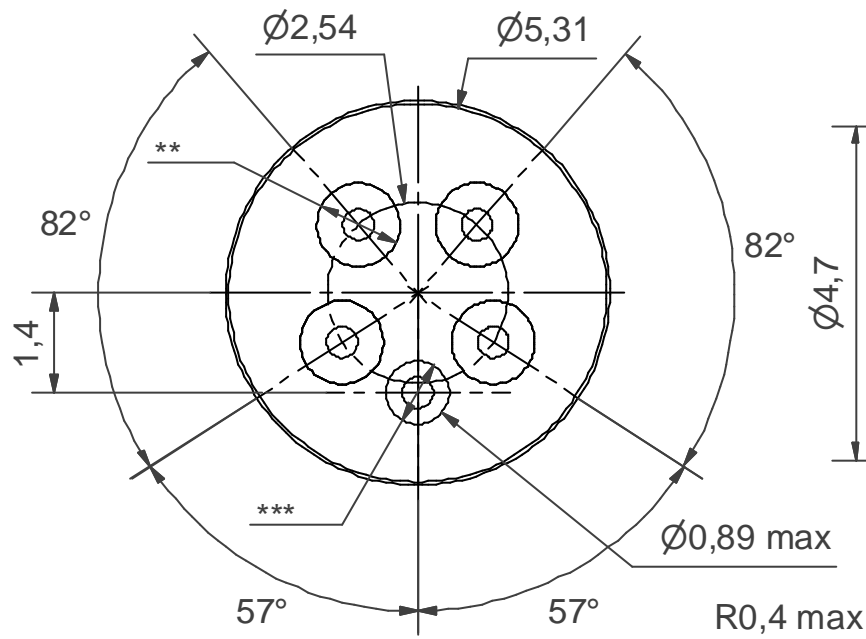
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ISSUE	1			
ACN	102546rev 1			
DATE	9-DEC-03			
APPRD.	MD/MA			

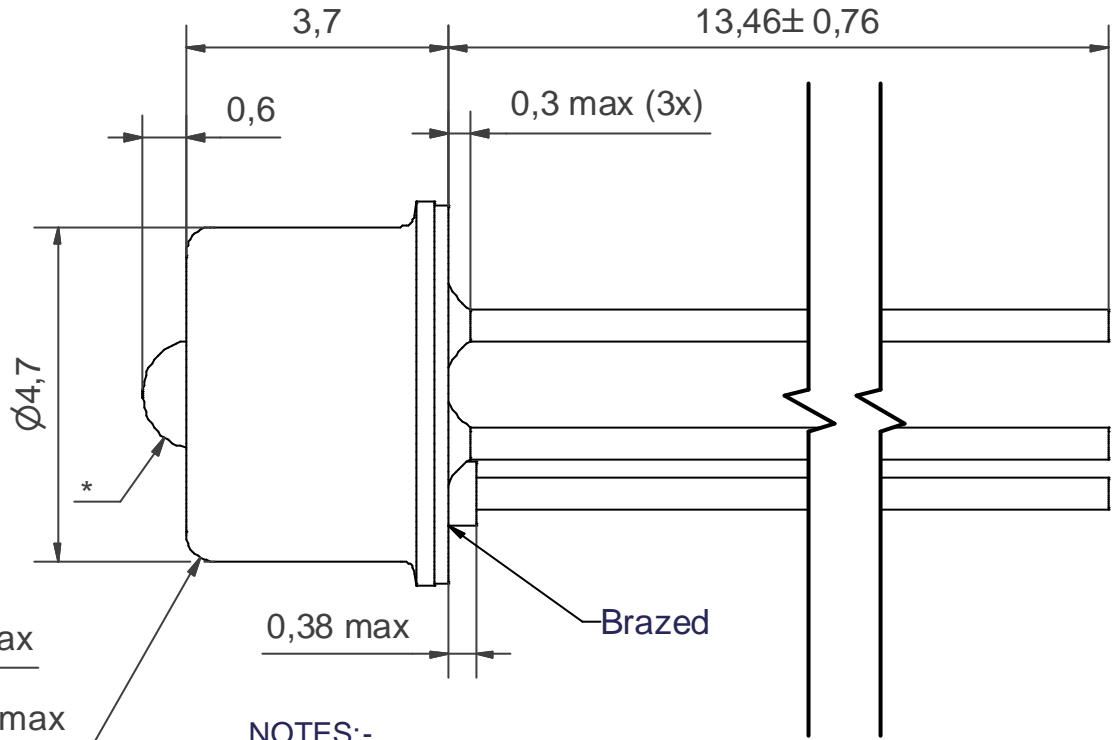


	Package code TE
Previous package codes	Drawing type TO-46 Package Outline in SC Connector housing
	Title 102546

BOTTOM VIEW (10 : 1)



SIDE VIEW



- * Lens $\varnothing 1.5 \pm 0.05$
- ** Glass sealing (4x): $\varnothing 1,17 + 0.05$
- *** Lead (5x): $\varnothing 0,44 + 0.05 / - 0,025$

- 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 .

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



	Package code TB
Previous package codes	Drawing type Package drawing, TO-46 with lens
	Title JS004172



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