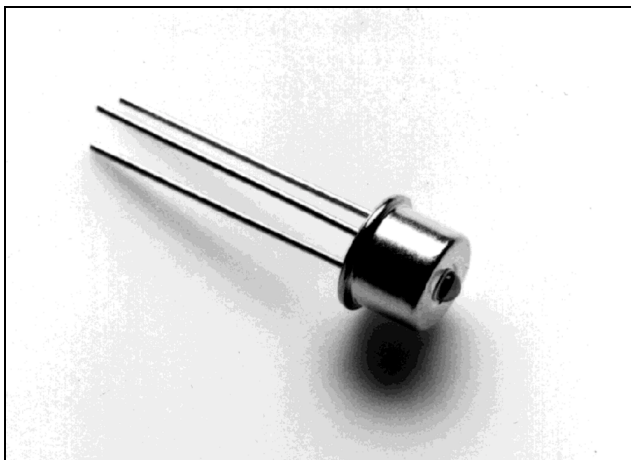


January 2004



Ordering Information

ZL60212/TBD TO-46 Package with lens
 ZL60212/TDD ST Housing

-55°C to +125°C

Description

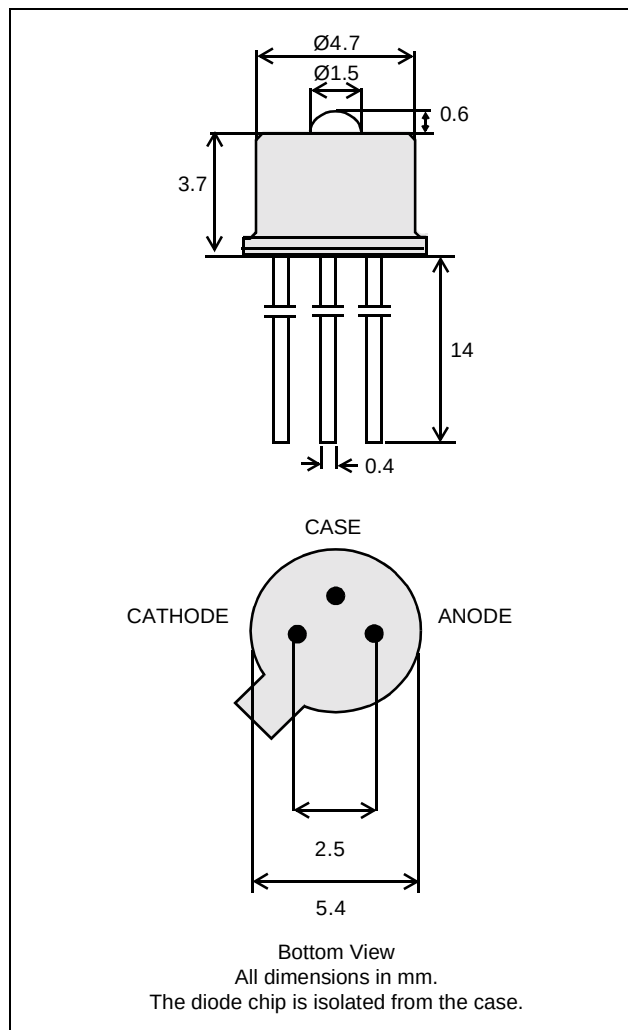
This single-chip device operates as both an Emitter and Detector, and transmits data over a single fiber in half-duplex mode; therefore, reducing both fiber and component costs when compared with traditional approaches.

Features

- Half Duplex over single fiber
- Single chip solution
- High speed
- Industrial temperature range
- Typical Rated Fiber couple power of 120 μ W

Applications

- Industrial control systems
- Long reach RS232
- Security systems
- Single fiber Datacom



TO-46 Package with Lens

Optical and Electrical Characteristics - Case Temperature 25°C

Parameter		Symbol	Min	Typ	Max	Unit	Test Condition	
Emitting Mode	Fiber-coupled Power (Figures 1, 2, and 3) (Table 1)	P_{fiber}	80	120		μW	$I_F = 60 \text{ mA}$ (See notes 1 and 2)	Fiber 62.5/125 μm
	Rise and Fall Time (10-90%)	t_r, t_f		7	10	ns	$I_F = 60 \text{ mA}$ (no bias)	Graded Index
	Bandwidth (3 dB)	f_c		50		MHz	$I_F = 60 \text{ mA}$	NA = 0.275
	Peak Wavelength	λ_p	860	880	890	nm	$I_F = 60 \text{ mA}$	
	Spectral Width (FWHM)	D1		50		nm	$I_F = 60 \text{ mA}$	
	Forward Voltage (Figure 5)	V_F		1.9	2.1	V	$I_F = 60 \text{ mA}$	
Receiving Mode	Responsivity (Figures 6, 7, and 8) (Table 2)	R	0.10	0.15		A/W	$V_R = 1 \text{ V}$ $\lambda = 880 \text{ nm}$	Fiber 62.5/125 μm
	Rise and Fall Time (10-90%)	t_r, t_f		7	10	ns	$V_R = 1 \text{ V}$ $R_L = 50 \text{ V}$ (no bias)	Graded Index
	Bandwidth	f_c		50		MHz	$V_R = 1 \text{ V}$ $R_L = 50 \text{ V}$	NA = 0.275
	Capacitance	C		30		pF	$V_R = 1 \text{ V}, f = 1 \text{ MHz}$	
	Dark Current	I_d		10	50	nA	$V_R = 1 \text{ V}$	

Note 1: Measured at the exit of 100 meters of fiber.

Note 2: Rated Fiber coupled power apply only on the TO-46 package, for housing options fiber coupled power is typically 10% less.

Absolute Maximum Ratings

Parameter	Symbol	Limit
Storage Temperature	T_{stg}	-55 to +125°C
Operating Temperature (derating: Figure 4)	T_{op}	-55 to +125°C
Electrical Power Dissipation (derating: Figure 4)	P_{tot}	160 mW
Continuous Forward Current ($f < 10 \text{ kHz}$)	I_F	80 mA
Peak Forward Current (duty Cycle < 50%, $f > 1 \text{ MHz}$)	I_{FRM}	130 mA
Reverse Voltage	V_R	2.0 V
Soldering Temperature (2 mm from the case for 10 sec.)	T_{sld}	260°C

Thermal characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance - Infinite Heat Sink	R_{thjc}			200	$^{\circ}\text{C}/\text{W}$
Thermal Resistance - No Heat Sink	R_{thja}			500	$^{\circ}\text{C}/\text{W}$
Temperature Coefficient - Optical Power	dP/dT_j		-0.4		$\%/^{\circ}\text{C}$
Temperature Coefficient - Wavelength	$d\lambda/dT_j$		0.3		$\text{nm}/^{\circ}\text{C}$
Temperature Coefficient - Responsivity	dR/dT_j		0.2		$\%/^{\circ}\text{C}$
Temperature Coefficient - Dark Current	dI_d/dT_j		2.5		$\%/^{\circ}\text{C}$

Typical Fiber-Coupled Power	
Core Diameter/Cladding Diameter Numerical Aperture	
50/125 μm 0.20	62.5/125 μm 0.275
55 μW	120 μW

Table 1 - Typical Fiber-Coupled Power

Typical Responsivity	
Core Diameter/Cladding Diameter Numerical Aperture	
50/125 μm 0.20	62.5/125 μm 0.275
0.15 A/W	0.15 A/W

Table 2 - Typical Responsivity

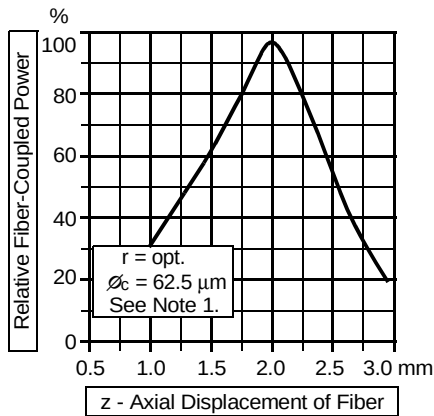


Figure 1 - z - Axial Displacement of Fiber

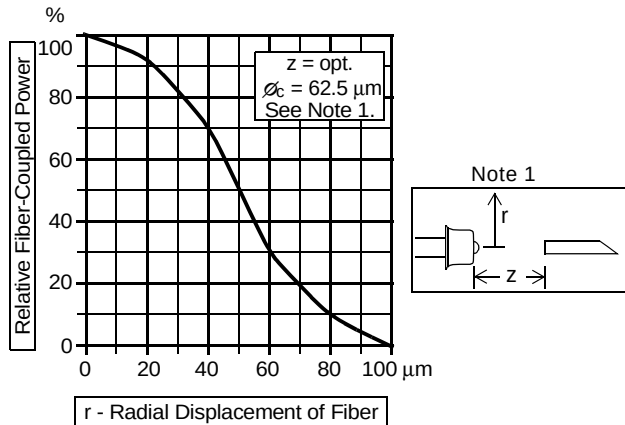


Figure 2 - r - Radial Displacement of Fiber

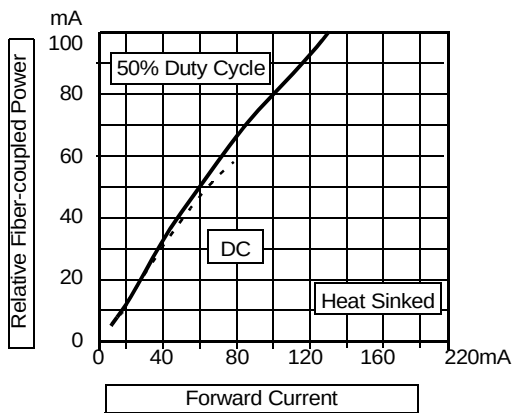


Figure 3 - Forward Current

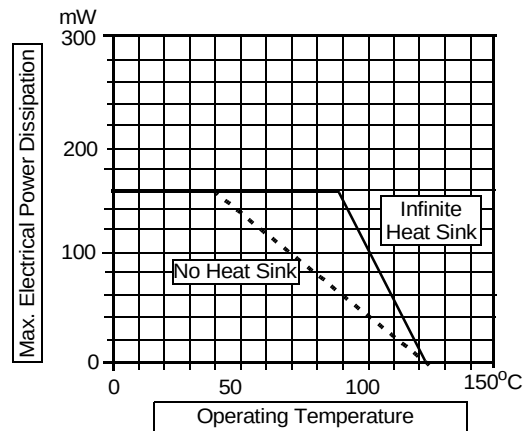


Figure 4 - Operating Temperature

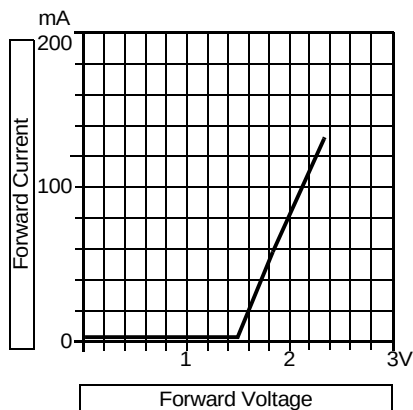


Figure 5 - Forward Voltage

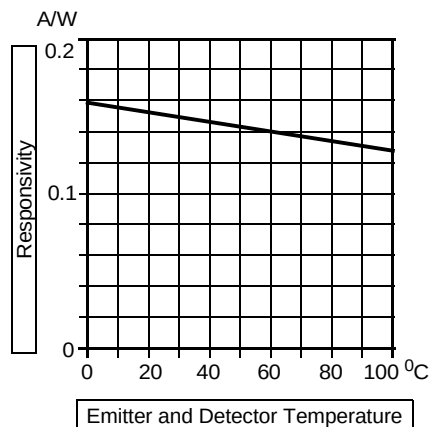


Figure 6 - Emitter and Detector Temperature

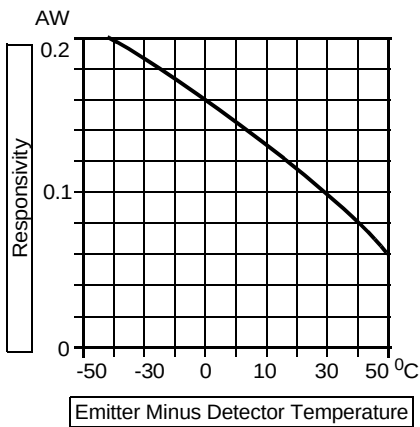


Figure 7 - Emitter Minus Detector Temperature

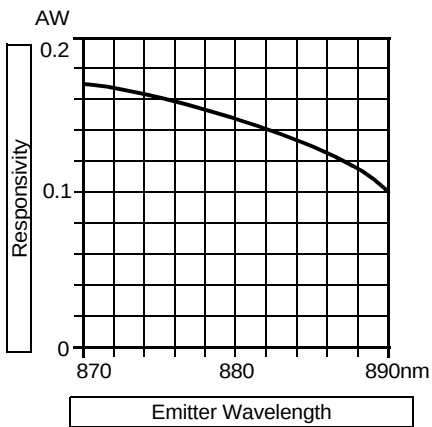
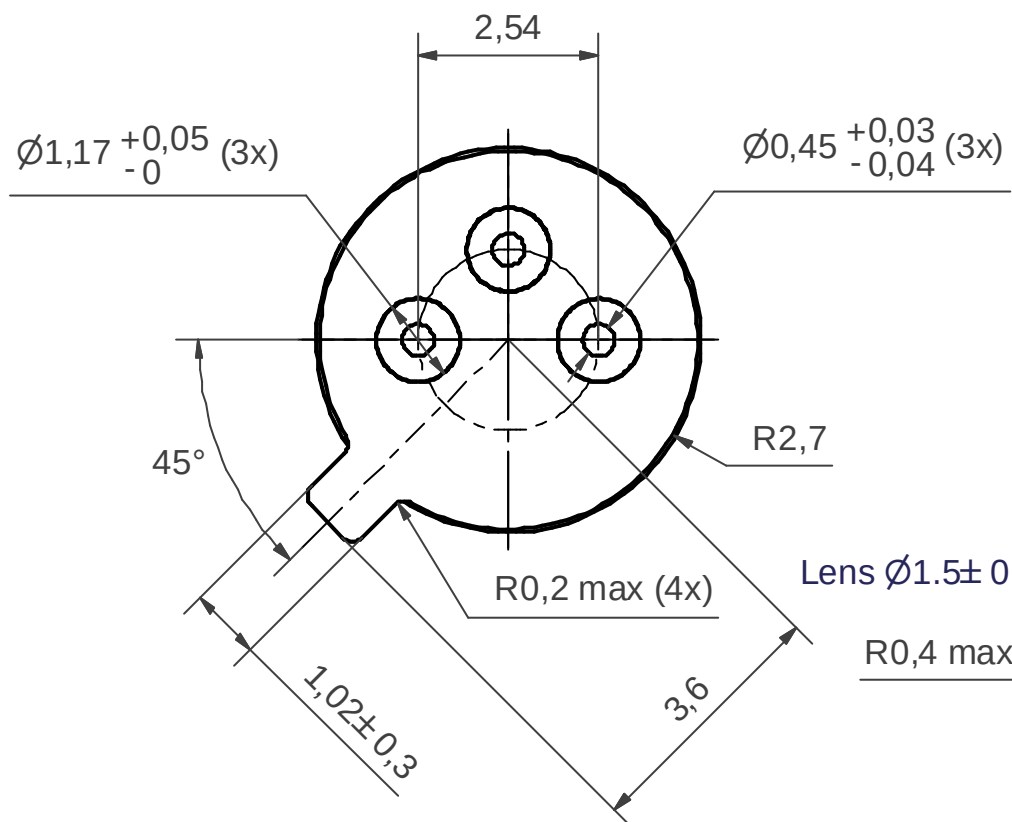
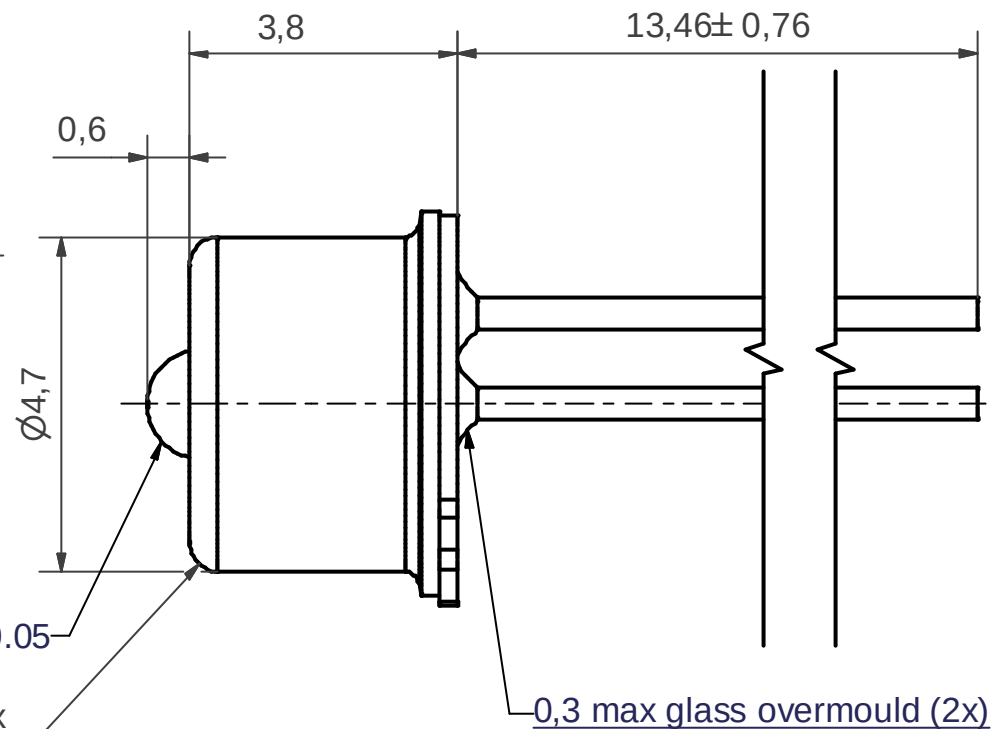


Figure 8 - Emitter Wavelength

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 2-3 μm / Au min 1,32 μm .

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Previous package codes	Drawing type Package drawing, TO-46 with lens
	Title JS004076



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