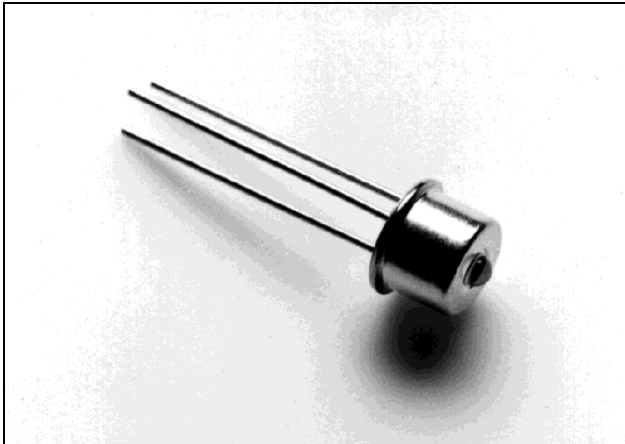


April 2004



### Features

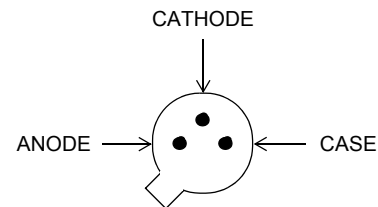
- 850 nm oxide confined VCSEL
- Data rate up to 3.1 Gbps
- High fiber coupling efficiency
- Optical field stable over temperature and current

### Applications

- High speed Data Communication and Telecommunication
- Gigabit Ethernet / InfiniBand / FiberChannel / ATM

### Ordering Information

ZL60001/TBD TO-46 with lens

**-0°C to +70°C**

Bottom View

The cathode is in electrical contact with the case.

**Figure 1 - Pin Diagram**

### Description

The ZL60001 is a high speed TO-46 assembled 850 nm VCSEL (Vertical Cavity Surface-Emitting Laser).

The product converts electrical current into optical power to be used for fibre optic communications.

The ZL60001 has a narrow beam divergence which is stable over temperature and current. This gives rise to high and stable fibre coupling efficiency without any additional lenses.



**WARNING: Laser Radiation, avoid exposure to beam. Class 3B laser product, potential eye hazard. Warning labels in each box**

**Optical and Electrical Characteristics – Case Temperature 25°C**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Fiber-Coupled Power (50/125 $\mu\text{m}$ fibre)	$P_{\text{fibre}}$	0.7			mW	$I_F = 7 \text{ mA}$
Optical Power	$P_O$			3.5	mW	$I_F = 7 \text{ mA}$
Threshold Current (0 – 70°C)	$I_{\text{th}}$	1		4.5	mA	
Forward Voltage	$V_F$	1.6		2.2	V	$I_F = 7 \text{ mA}$
Centre wavelength	$\lambda_C$	830	850	860	nm	$I_F = 7 \text{ mA}$
RMS Spectral Width	$\Delta\lambda$			0.85	nm	$I_F = 7 \text{ mA}$
Differential resistance	$R_{\text{diff}}$			50	$\Omega$	$I_F = 7 \text{ mA}$
Relative Intensity Noise	RIN			-120	dB/Hz	$I_F = 7 \text{ mA}$ , Note 1
Optical Rise Time (20%-80%)	$t_r$		80	130	ps	Note 2
Optical Fall Time (20%-80%)	$t_f$		100	140	ps	Note 2
Beam divergence ( $1/e^2$ )	$\theta$	5		15	$^\circ$	Note 3

Note 1: ANSI X3.230-1994

Note 2: InfiniBand sec. 8.5.3.2

Note 3: Over operating current and bias over threshold

**Absolute Maximum Ratings**

Parameter	Symbol	Limit
Storage Temperature	$T_S$	-40 to +100°C
Operating Temperature (case)	$T_O$	0 to +70°C
Electrical Power Dissipation	$P_{\text{diss}}$	35 mW
Continuous Forward Current ( $f < 10 \text{ kHz}$ )	$I_F$	15 mA
Reverse Voltage	$V_R$	5 V
Soldering Temperature (2 mm from case for 10 sec)	$T_{\text{sld}}$	260°C

**Thermal Characteristics**

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance – Infinite Heat Sink	$R_{\text{thjc}}$		1300		$^\circ\text{C/W}$
Thermal Resistance – No Heat Sink	$R_{\text{thja}}$		1600		$^\circ\text{C/W}$
Temp. Coefficient - Wavelength	$d\lambda/dT_j$		0.06		nm/ $^\circ\text{C}$
Optical Power – Variation (0 – 70°C)	$\Delta P_O$		$\pm 0.3$		%/ $^\circ\text{C}$
Threshold Current – Variation (0 – 70°C)	$\Delta I_{\text{th}}$		$\pm 0.6$		mA

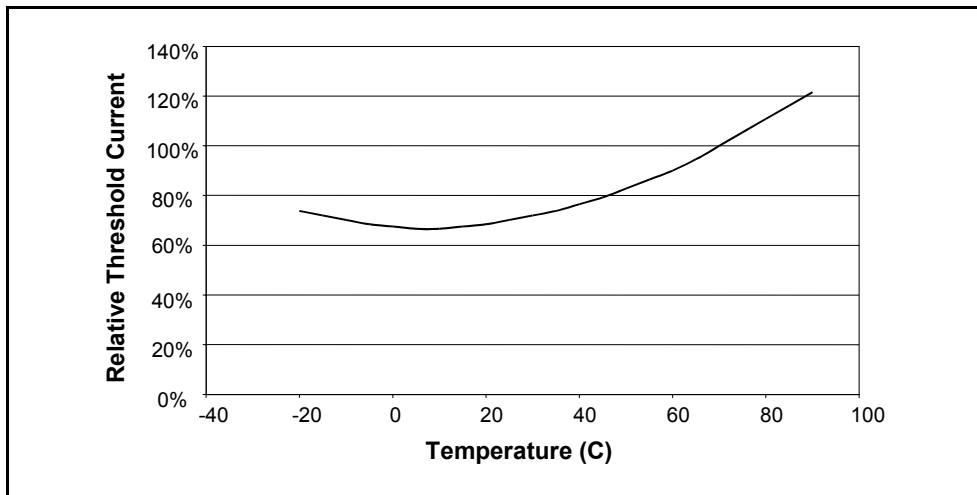


Figure 2 - Threshold Current over Temperature

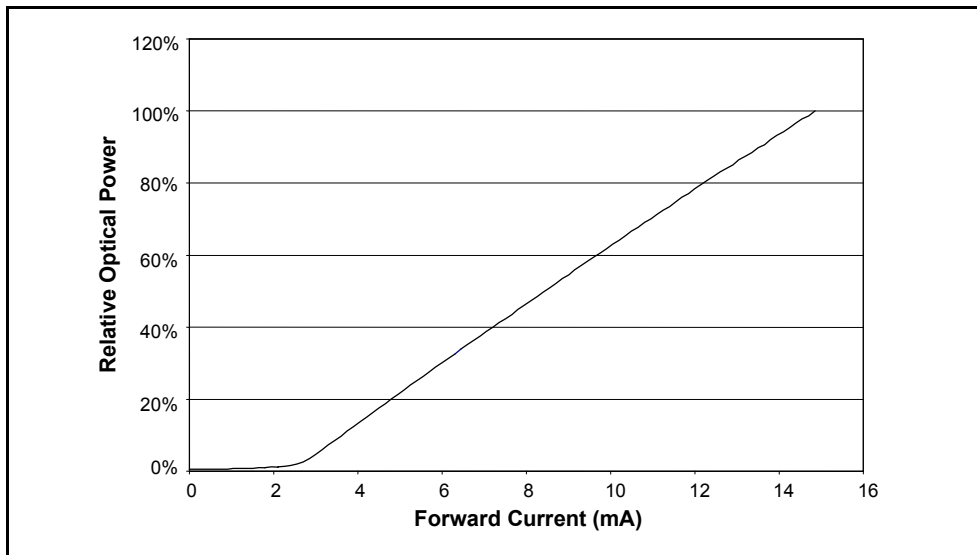
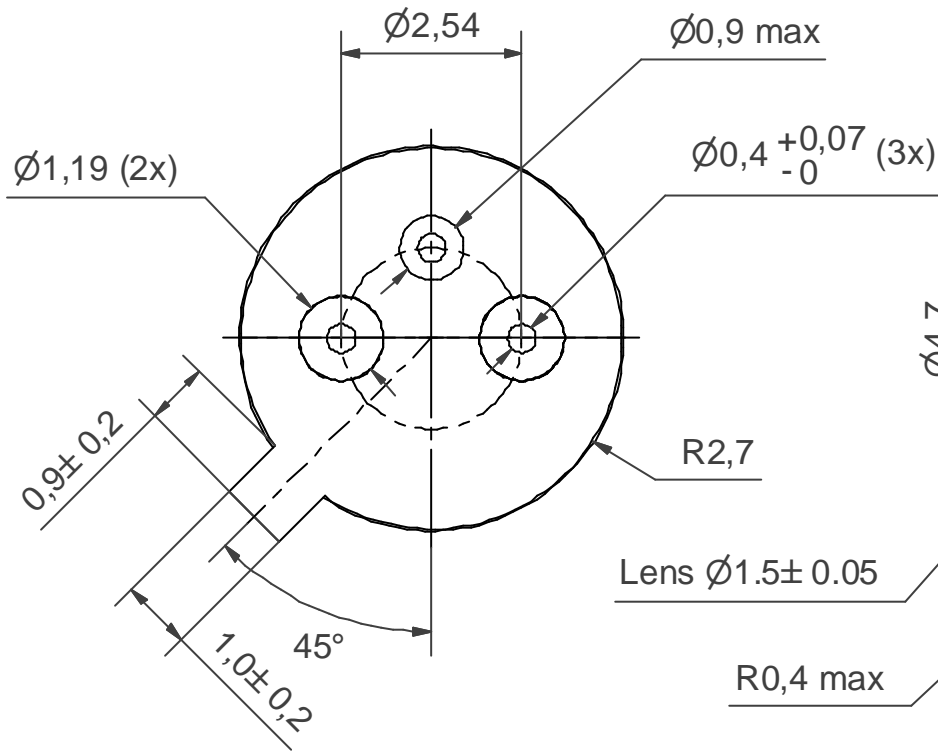
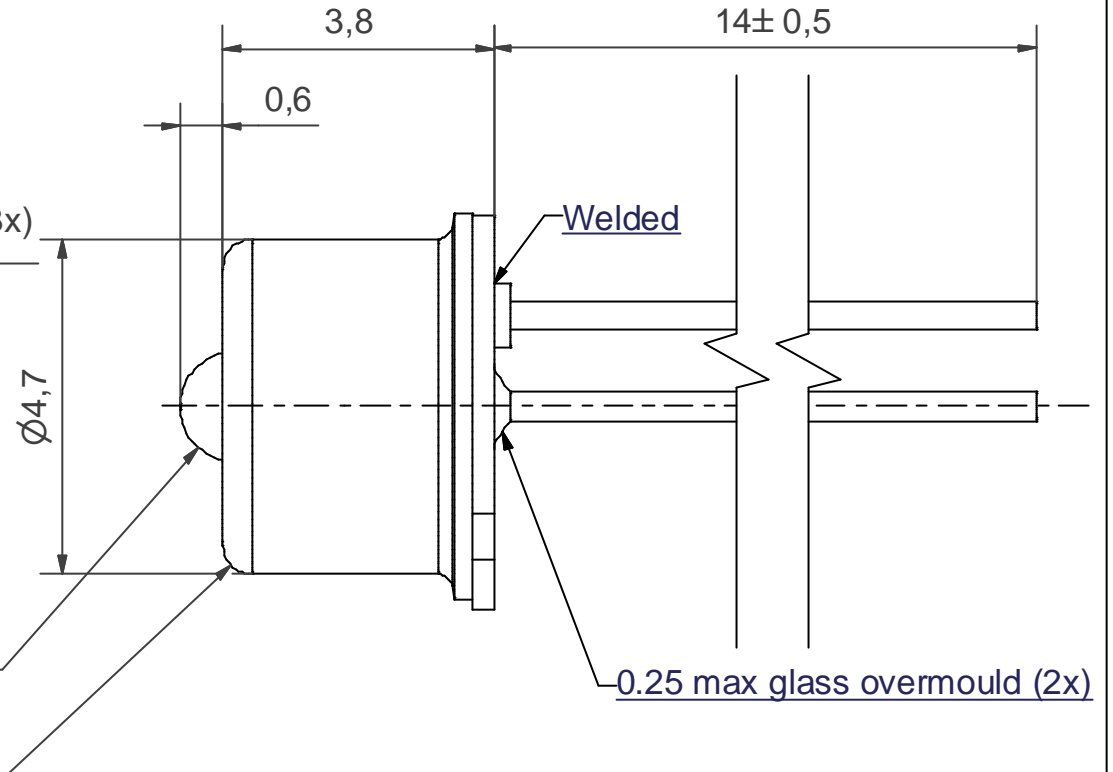


Figure 3 - Optical Power vs Forward Current

# 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.

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	Package code <b>TB</b>
Previous package codes	Drawing type Package drawing, TO-46 with lens
	Title <b>JS004077</b>



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