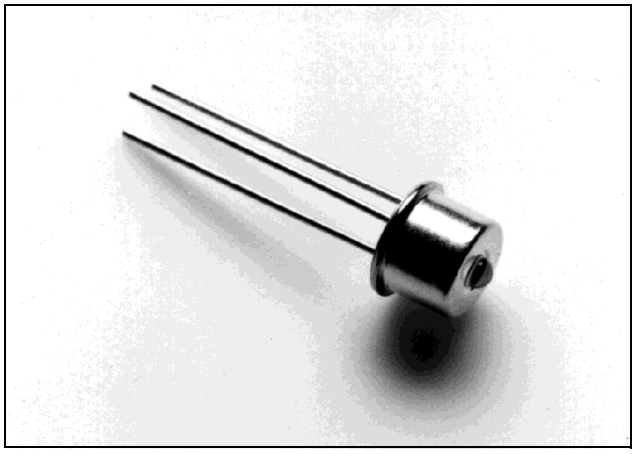
ZARLINK SEMICONDUCTOR

ZL60001

# High speed 2.5 Gbps 850 nm VCSEL

Data Sheet

April 2004



**Ordering Information**

ZL60001/TBD TO-46 with lens

**-0°C to +70°C**

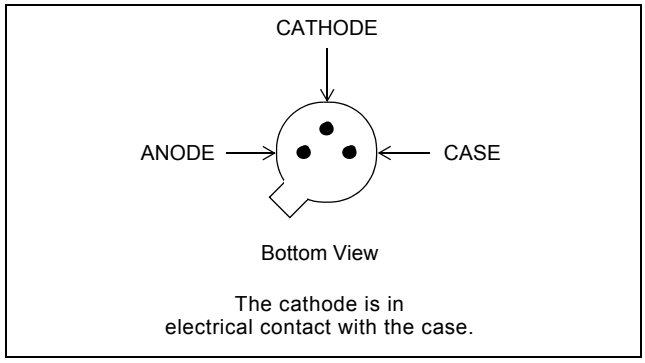



**Figure 1 - Pin Diagram**

## 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

## 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 μm fibre) | $P_{fibre}$ | 0.7 | | | mW | $I_F$ = 7 mA |
| Optical Power | $P_O$ | | | 3.5 | mW | $I_F$ = 7 mA |
| Threshold Current (0 – 70°C) | $I_{th}$ | 1 | | 4.5 | mA | |
| Forward Voltage | $V_F$ | 1.6 | | 2.2 | V | $I_F$ = 7 mA |
| Centre wavelength | $\lambda_C$ | 830 | 850 | 860 | nm | $I_F$ = 7 mA |
| RMS Spectral Width | $\Delta\lambda$ | | | 0.85 | nm | $I_F$ = 7 mA |
| Differential resistance | $R_{diff}$ | | | 50 | Ω | $I_F$ = 7 mA |
| Relative Intensity Noise | RIN | | | -120 | dB/Hz | $I_F$ = 7 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 ($1/e^2$) | θ | 5 | | 15 | ° | 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 | $P_{diss}$ | 35 mW |
| Continuous Forward Current (f<10 kHz) | $I_F$ | 15 mA |
| Reverse Voltage | $V_R$ | 5 V |
| Soldering Temperature (2 mm from case for 10 sec) | $T_{sld}$ | 260°C |

**Thermal Characteristics**

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

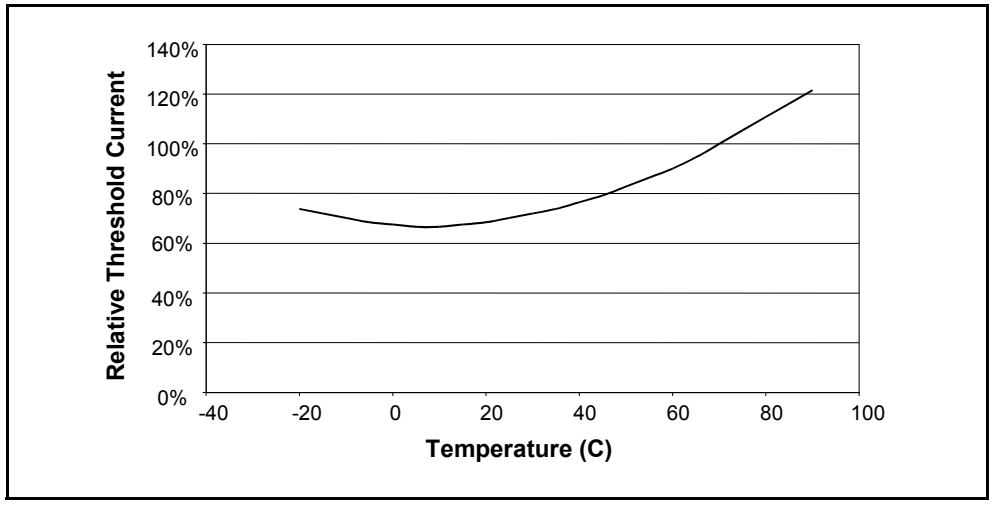



**Figure 2 - Threshold Current over Temperature**

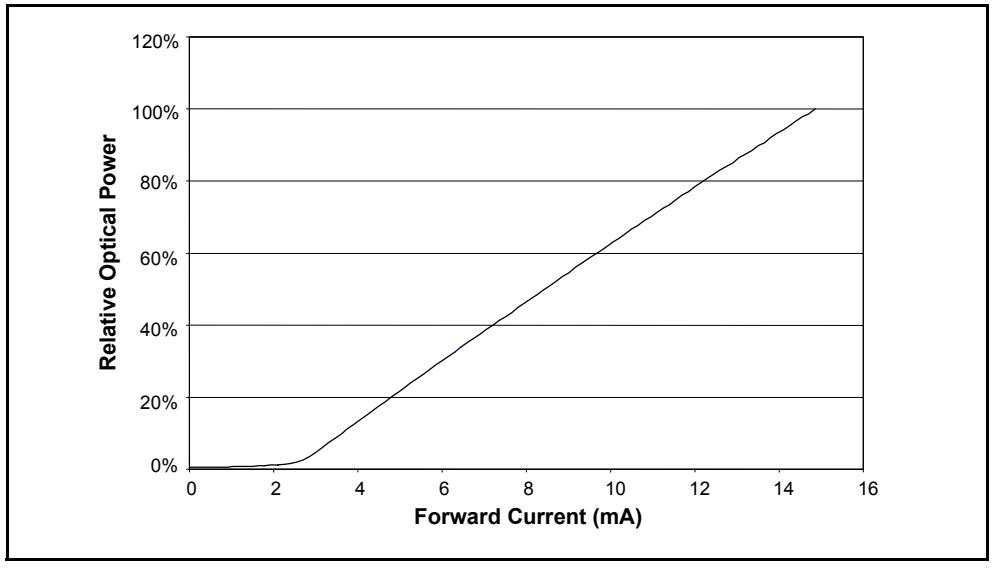
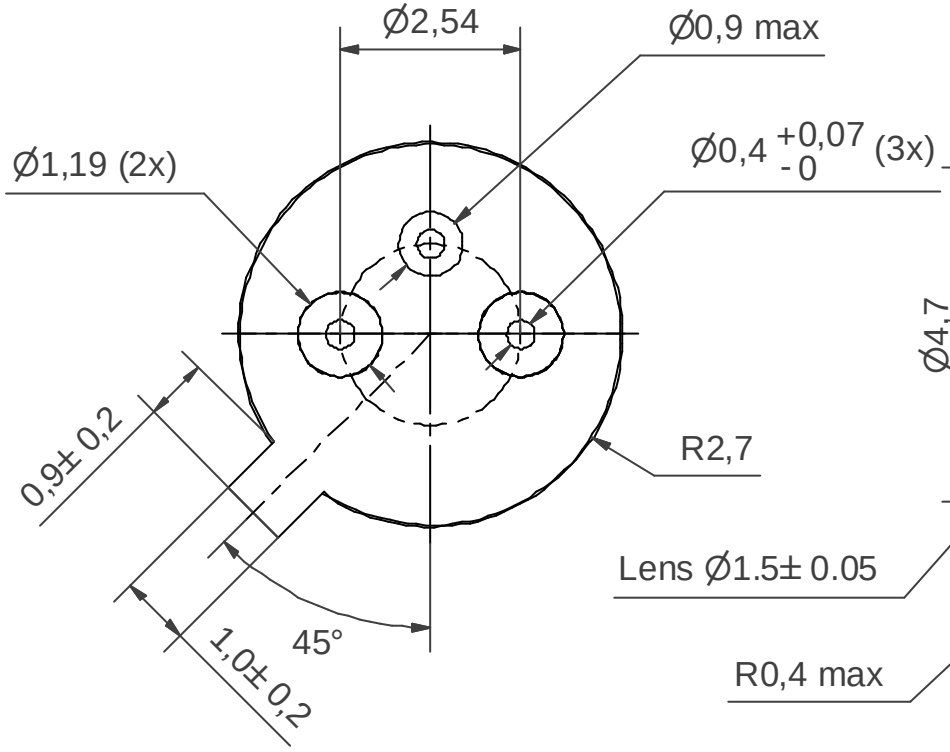
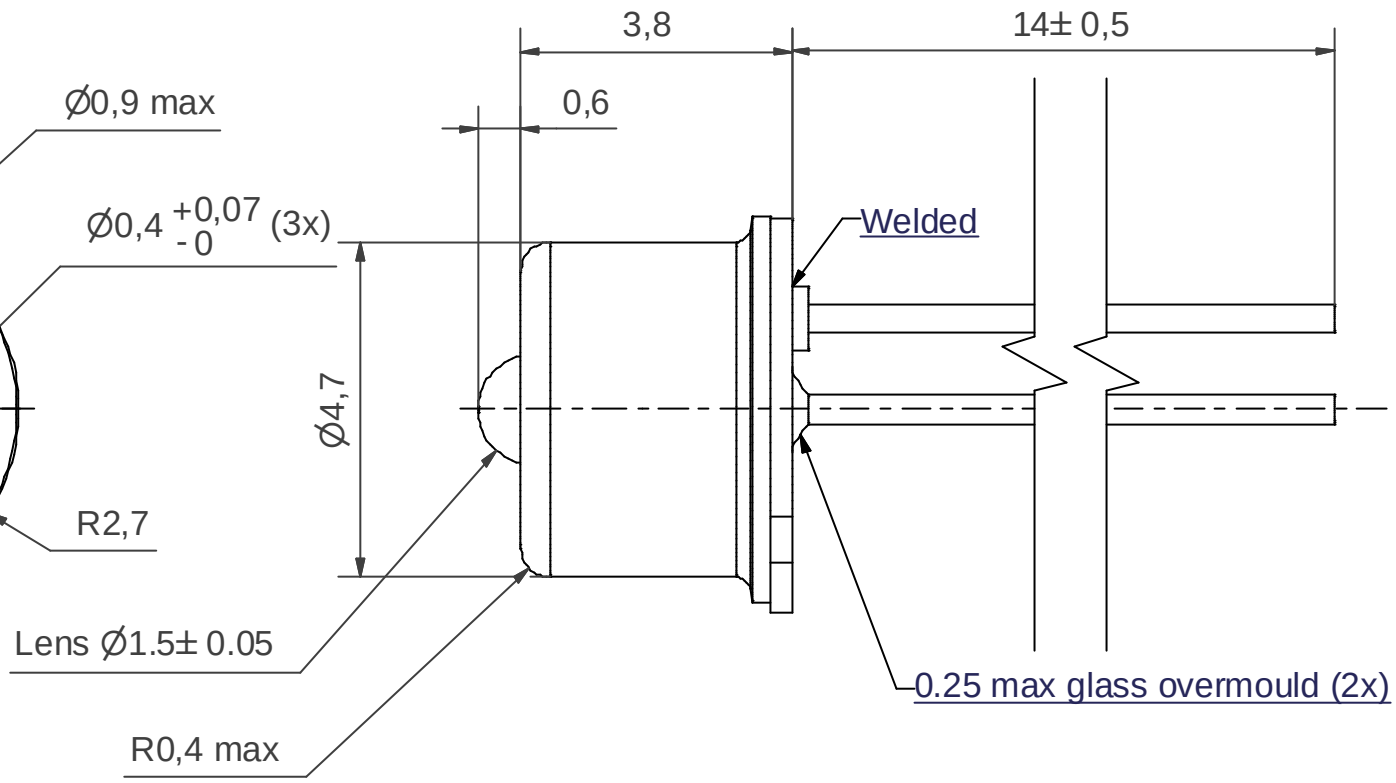



**Figure 3 - Optical Power vs Forward Current**

## 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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|---|---|---|---|---|
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ZARLINK SEMICONDUCTOR

Previous package codes

Package code TB

Drawing type
Package drawing, TO-46 with lens

Title JS004077

**For more information about all Zarlink products**
**visit our Web Site at**

## www.zarlink.com



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