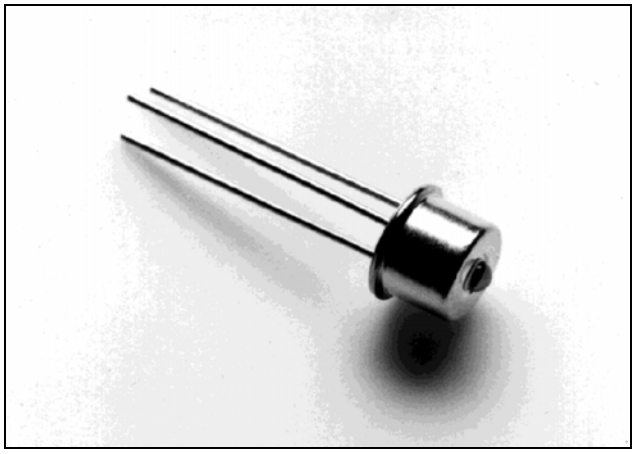
ZL60005

VCSEL Laser Diode

Data Sheet

August 2004



Ordering Information

ZL60005/TBD	TO-46 Package
ZL60005/TDD	ST Housing
ZL60005/TGD	SMA Housing

0°C to +70°C

Note: Rated Optical Power apply only on the TO-46 package, for housing options optical power is typically 10% less.

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

Features

- High power
- Low beam divergence
- Low drive current
- Hermetically sealed
- Easy alignment

Applications

- Fiber optic datalinks
- Position sensor
- Range finder
- Free air datalinks
- Optical storage

Description

This High-Power VCSEL (Vertical Cavity Surface-Emitting Laser) is designed for industrial and sensors applications. It operates in multiple transverse and single longitudinal mode, ensuring stable output power and low noise.

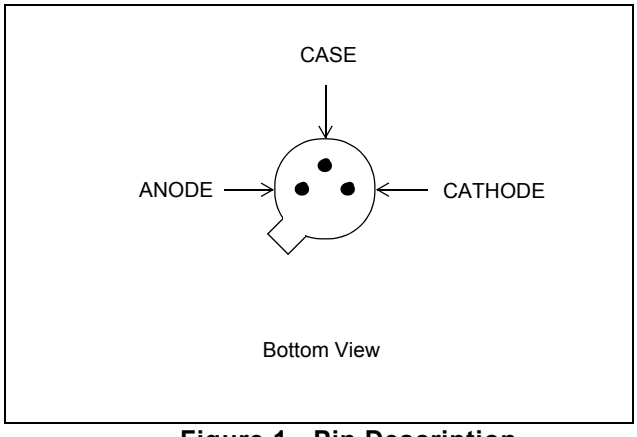


Figure 1 - Pin Description

Optical and Electrical Characteristics - Case Temperature 25°C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Optical Power	P_o	6	7		mW	I_F=40 mA. Note 1
Slope Efficiency (dP_o/dI_F)	h		300		mW/A	I_F=40 mA
Beam Divergence	Θ		11		deg	Full Width at I/e^2
Bandwidth 3 dB_{el})	f_c	1			GHz	I_F=40 mA
Peak Wavelength	I_p	830	845	860	nm	I_F=40 mA
Spectral Width	DI		0.5	1.5	nm	I_F=40 mA
Forward voltage	V_F		2.0	2.3	V	I_F=40 mA
Threshold Current	I_{th}		14	19	mA	

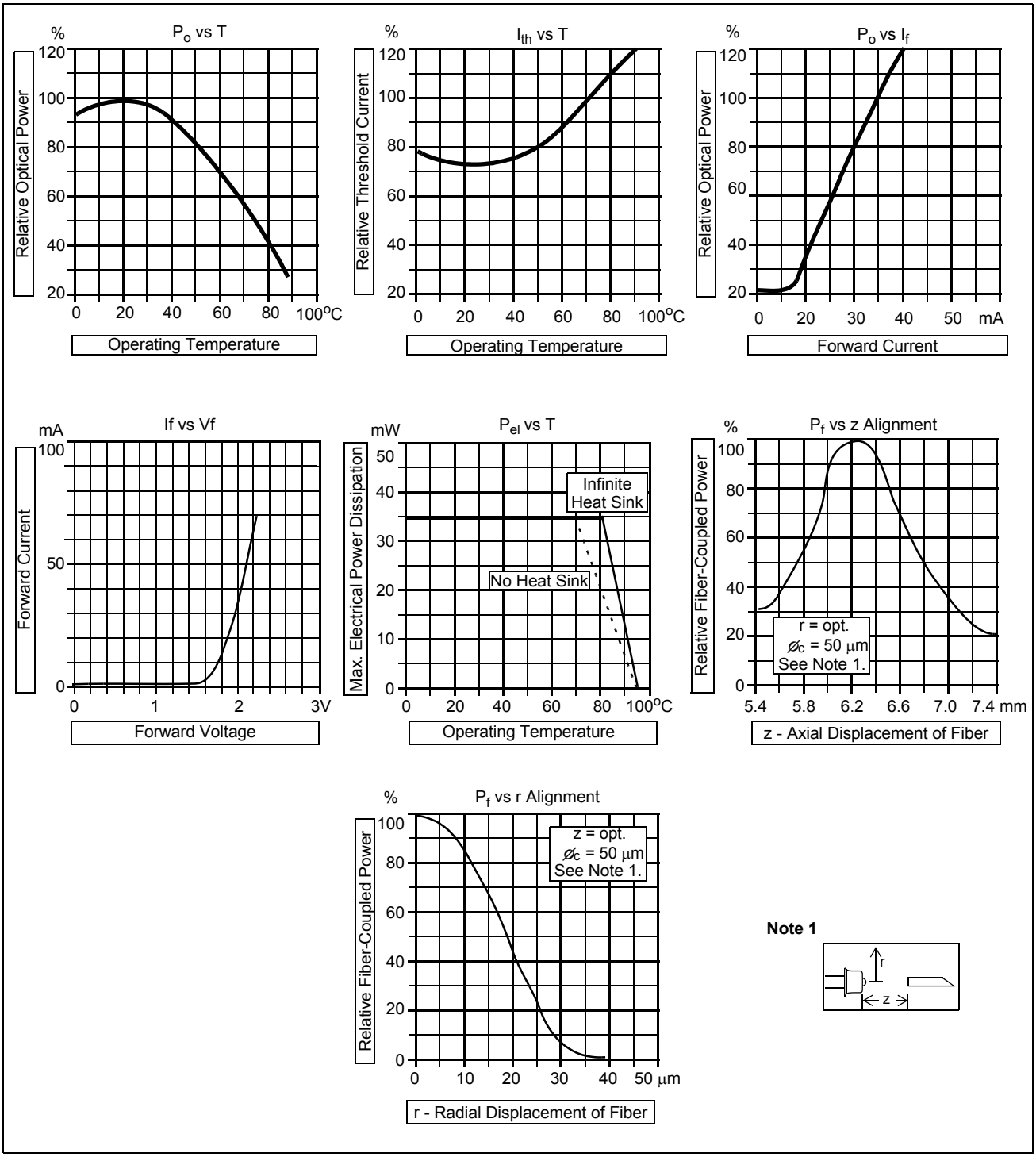
Note 1: Measured with 10 ms pulse.

Absolute Maximum Ratings - Not necessarily applied together. Exceeding these values may cause permanent damage. Functional operation under these conditions is not implied.

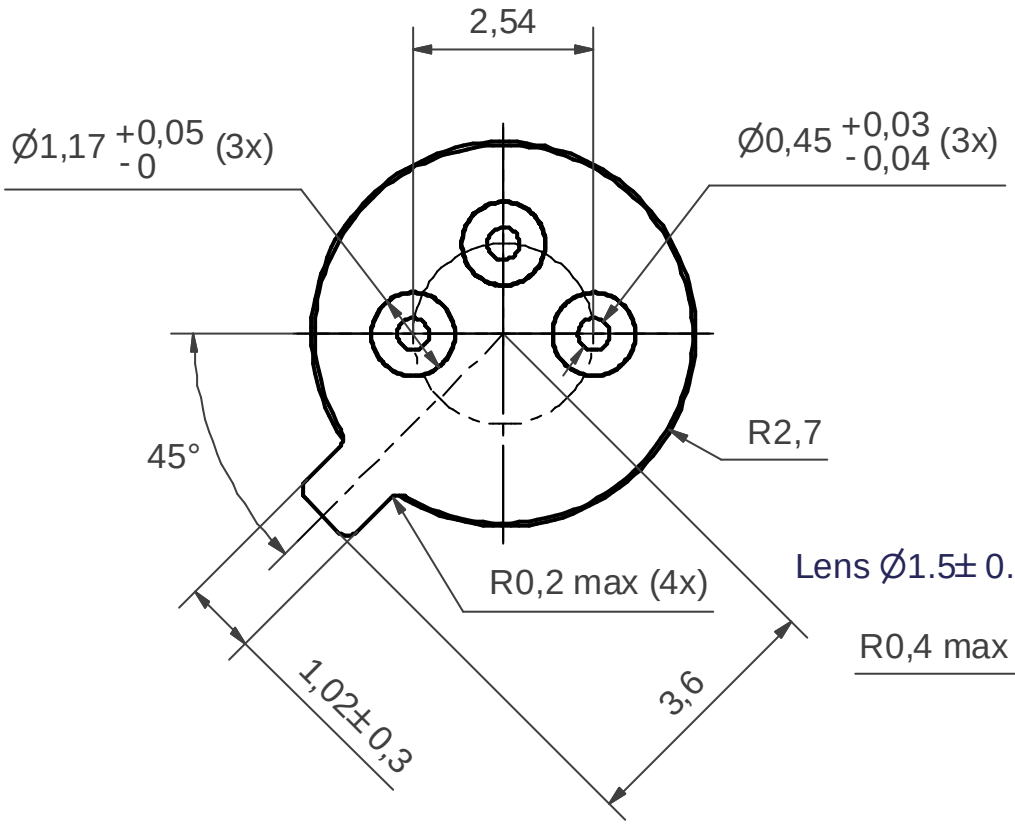
Parameter	Symbol	Limit
Storage Temperature	T_{stg}	-55 to +125°C
Operating Temperature	T_{op}	0 to +70°C
Electrical Power Dissipation	P_{tot}	100 mW
Continuous Forward Current (f<10 kHz)	I_F	50 mA
Peak Forward Current (duty Cycle<50%, f>1 MHz	I_{FRM}	80 mA
Reverse Voltage	V_R	1.5 V
Soldering Temperature (2 mm from the case for 10 sec.)	T_{sld}	260°C

Thermal characteristics

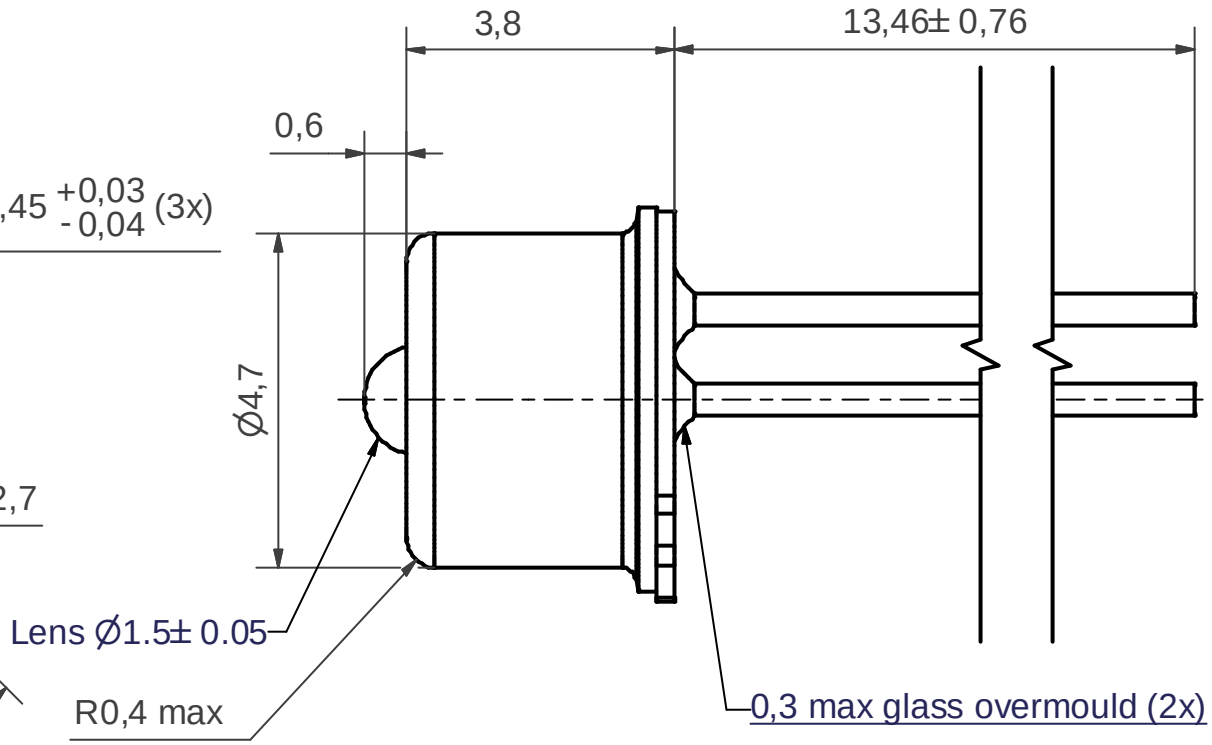
Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance - Infinite Heat Sink	R_{thjc}		200		°C/W
Thermal Resistance - No Heat Sink	R_{thja}		500		°C/W
Temp Coefficient - Wavelength	$d\lambda/dT_j$		0.06		nm/°C
Optical Power - Variation 0 to 70^0C	ΔP		3		dB
Threshold Current - Variation 0 to 70^0C	$\Delta/_{th}$		5		mA


% P_o vs T
Relative Optical Power
120
100
80
60
40
20
0 20 40 60 80 100°C
Operating Temperature
% I_{th} vs T
Relative Threshold Current
120
100
80
60
40
20
0 20 40 60 80 100°C
Operating Temperature
% P_o vs I_f
Relative Optical Power
120
100
80
60
40
20
0 20 30 40 50 mA
Forward Current
mA If vs Vf
Forward Current
100
50
0
0 1 2 3V
Forward Voltage
mW P_{el} vs T
Max. Electrical Power Dissipation
50
40
30
20
10
0
Infinite Heat Sink
No Heat Sink
0 20 40 60 80 100°C
Operating Temperature
% P_f vs z Alignment
Relative Fiber-Coupled Power
100
80
60
40
20
0
r = opt.
⌀c = 50 μm
See Note 1.
5.4 5.8 6.2 6.6 7.0 7.4 mm
z - Axial Displacement of Fiber
% P_f vs r Alignment
Relative Fiber-Coupled Power
100
80
60
40
20
0
z = opt.
⌀c = 50 μm
See Note 1.
0 10 20 30 40 50 μm
r - Radial Displacement of Fiber
Note 1
r
z

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.

ISSUE	1			
ACN	JS004076R1A			
DATE	22-MAR-03			
APPRD.	TD/BE			

ZARLINK SEMICONDUCTOR

Previous package codes

Package code TB

Drawing type
Package drawing, TO-46 with lens

Title JS004076

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www.zarlink.com

TECHNICAL DOCUMENTATION - NOT FOR RESALE