

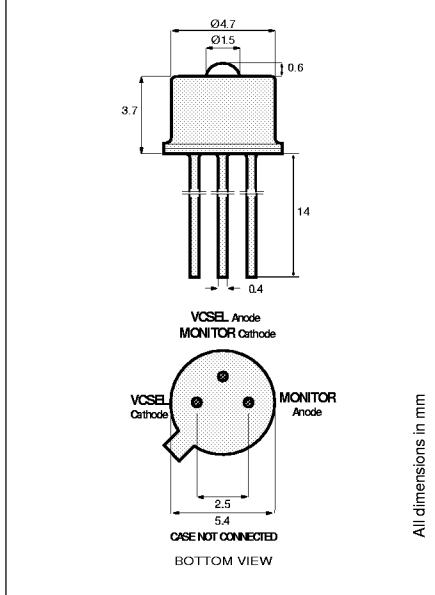
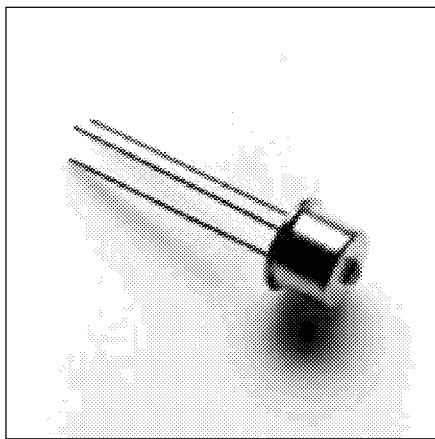
# PRODUCT INFORMATION

**PRELIMINARY/β**

840nm **2B481**  
VCSEL Laser Diode

Datacom

This Vertical Cavity Surface-Emitting Laser is designed for Fibre Channel, Gigabit Ethernet, ATM and general applications. It incorporates a photodiode to monitor the optical power and allow for feedback control. For eye safety, the optical power is attenuated to comply with IEC Laser Class 1 requirements.



TO-46 Package With Lens

**Class 1 Laser Product**

| Optical and Electrical Characteristics (25°C Case Temperature) |                    |      |      |      |               |                                     |
|--|--------------------|------|------|------|---------------|-------------------------------------|
| PARAMETER  | SYMBOL             | MIN. | TYP. | MAX. | UNIT          | TEST CONDITION                      |
| Fiber-Coupled Power  | $P_{\text{fiber}}$ | 100  |      |      | $\mu\text{W}$ | $I_F=12\text{mA}$ (Note 1)          |
| Optical Power  | $P_O$              |      |      | 400  | $\mu\text{W}$ | $I_F=12\text{mA}$ (Note 2)          |
| Slope Efficiency ( $dP_O/dI_F$ )                               | $\eta$             |      | 50   |      | mW/A          | $I_F=12\text{mA}$                   |
| Bandwidth (3dB <sub>e1</sub> )                                 | $f_C$              |      | 2    |      | GHz           | $I_F=12\text{mA}$                   |
| Peak Wavelength  | $\lambda_p$        | 830  | 840  | 860  | nm            | $I_F=12\text{mA}$                   |
| Spectral Width (FWHM)  | $\Delta\lambda$    |      | 0.5  | 1    | nm            | $I_F=12\text{mA}$                   |
| Forward Voltage  | $V_F$              |      | 1.9  | 2.2  | V             | $I_F=12\text{mA}$                   |
| Threshold Current  | $I_{th}$           |      | 3.5  | 6    | mA            |                                     |
| Monitor Current  | $I_m$              | 30   | 100  |      | $\mu\text{A}$ | $I_F=12\text{mA}$ , $V_R>1\text{V}$ |
| Monitor Dark Current   | $I_d$              |      |      | 30   | nA            | $V_R=5\text{V}$                     |
| Relative Intensity Noise                                       | RIN                |      | -130 |      | dB/Hz         | $I_F=12\text{mA}$ , $f=1\text{GHz}$ |

**Note 1:** Fiber: 50/125 Graded Index, NA=0.2 or 62.5/125 Graded Index, NA=0.275.

**Note 2:** Complies with laser Class 1 when operated at max 12 mA; Class 3 above 12 mA.

| Absolute Maximum Ratings  |                   |               |
|---|-------------------|---------------|
| PARAMETER   | SYMBOL            | LIMIT         |
| Storage Temperature   | $T_{\text{stg}}$  | -55 to +125°C |
| Operating Temperature   | $T_{\text{op}}$   | 0 to +70°C    |
| Electrical Power Dissipation  | $P_{\text{tot}}$  | 35 mW         |
| Continuous Forward Current ( $f \leq 10\text{kHz}$ )                  | $I_F$             | 15 mA         |
| Peak Forward Current (duty cycle $\leq 50\%$ , $f \geq 1\text{MHz}$ ) | $I_{\text{FRM}}$  | 25 mA         |
| VCSEL Reverse Voltage   | $V_R$             | 1.5 V         |
| Soldering Temperature (2mm from the case for 10 sec)                  | $T_{\text{slid}}$ | 260°C         |

| Thermal Characteristics                 |                   |      |           |      |       |
|---|-------------------|------|-----------|------|-------|
| PARAMETER                               | SYMBOL            | MIN. | TYP.      | MAX. | UNIT  |
| Thermal Resistance - Infinite Heat Sink | $R_{\text{thjc}}$ |      | 500       |      | °C/W  |
| Thermal Resistance - No Heat Sink       | $R_{\text{thja}}$ |      | 800       |      | °C/W  |
| Temp. Coefficient - Wavelength          | $d\lambda/dT_j$   |      | 0.06      |      | nm/°C |
| Optical Power - Variation 0 to 70°C     | $\Delta P$        |      | $\pm 0.7$ |      | dB    |
| Threshold Current - Variation 0 to 70°C | $\Delta I_{th}$   |      | $\pm 0.6$ |      | mA    |

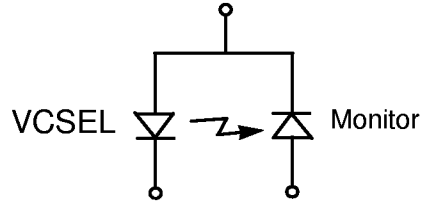
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**2B481**  
VCSEL Laser Diode 840nm



The VCSEL Anode is common with the Monitor Cathode.

**Functional schematic**