



Laser Diode Discrete Mode EP2004-DM-B Series



The EP2004-DM-B laser diode module is a cost effective, highly coherent laser source. The patented discrete mode (DFB-like) ridge waveguide technology and epistructure design is used to deliver an InP-based strained quantum-well laser diode source emitting at a wavelength of 2.004µm with high SMSR. The Discrete Mode laser diode chip is packaged in an industry standard, hermetically sealed 14 pin butterfly package with integrated optical isolator, thermo-electric cooler (TEC), monitor photodiode and thermistor.

Key Features

- Excellent reliability
- Mode-Hop free tuning >2nm
- Integrated optical isolator
- Narrow linewidth <2MHz

Applications

- High performance gas sensing
- Carbon Dioxide (CO₂) Detection**

Optical and electrical characteristics: (T = 25°C)

| PARAMETER | SYMBOL | MIN | TYP | MAX | UNIT |
|--|-----------------|------|------|------|-------|
| LASER DIODE | | | | | |
| Output Power in Fibre | P_f | - | 2 | 3 | mW |
| Centre Wavelength | λ_{cen} | 1950 | 2004 | 2150 | nm |
| Threshold Current | I_{th} | - | 20 | 40 | mA |
| Operating Current | I_{op} | - | 70 | 120 | mA |
| Forward Voltage | V_f | - | 1.3 | 1.6 | V |
| Side Mode Suppression Ratio | SMSR | 30 | 40 | - | dB |
| Temperature Tuning Coefficient | | - | 0.1 | - | nm/K |
| Current Tuning Coefficient | | - | 0.01 | - | nm/mA |
| Quantum Efficiency | η | 0.02 | 0.03 | - | mW/mA |
| MONITOR DIODE* | | | | | |
| Monitor Photo Current | I_m | 0.2 | 0.4 | 0.8 | mA |
| Monitor Operating Voltage | V_m | - | - | 5.5 | V |
| Monitor Dark Current (at 5V V_{DR}) | I_{md} | - | - | 0.2 | µA |

| THERMISTOR | | | | | |
|------------------------------|--------------|--|-------|------|---------------|
| Thermistor Resistance | R_T | 9.5 | 10 | 10.5 | kW |
| Thermistor Temp. Coefficient | | - | -4.4 | - | %/°C |
| Thermoelectric Cooler | | | | | |
| TEC Forward Current | I_C | - | - | 1.2 | A |
| TEC Forward Voltage | V_C | - | - | 2.5 | V |
| FIBER | | | | | |
| Type | - | single mode / polarisation maintaining | | | |
| Core/Cladding Diamter | D_c/D_{cl} | - | 7/125 | - | μm |
| Length | L | 0.5 | - | - | m |
| Optical Connector | - | FC/APC, FC/PC others available on request | | | |

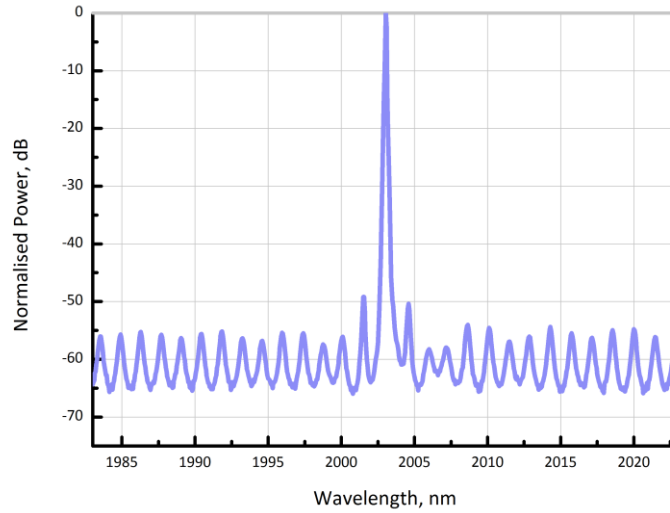
Absolute Maximum Ratings ($T_{\text{sub}} = 25^\circ\text{C}$)

| Parameter | Symbol | Ratings | Units |
|-----------------------------|-------------------|-----------|-------|
| Laser diode reverse voltage | V_R | 2 | V |
| Laser diode forward current | I_F | 120 | mA |
| Photodiode reverse voltage | V_{DR} | 20 | V |
| Peltier current | I_P | 1.2 | A |
| Operating case temperature | T_{case} | -20 to 65 | °C |
| Storage temperature | T_{stg} | -40 to 85 | °C |

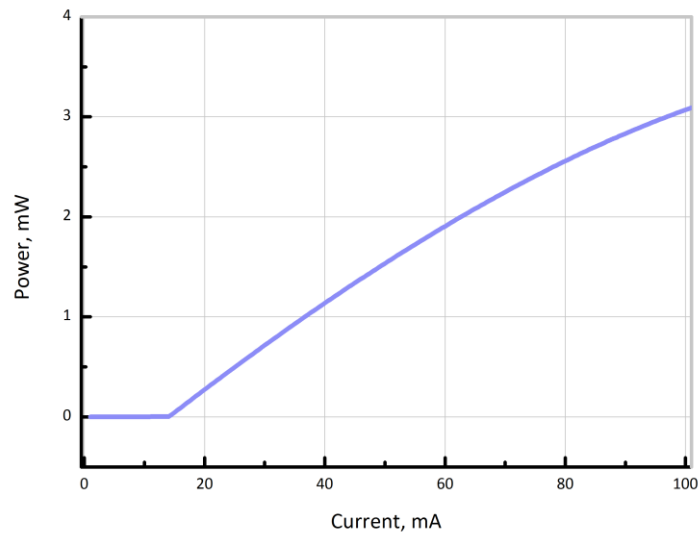


TYPICAL PERFORMANCE

Typical CW Spectrum

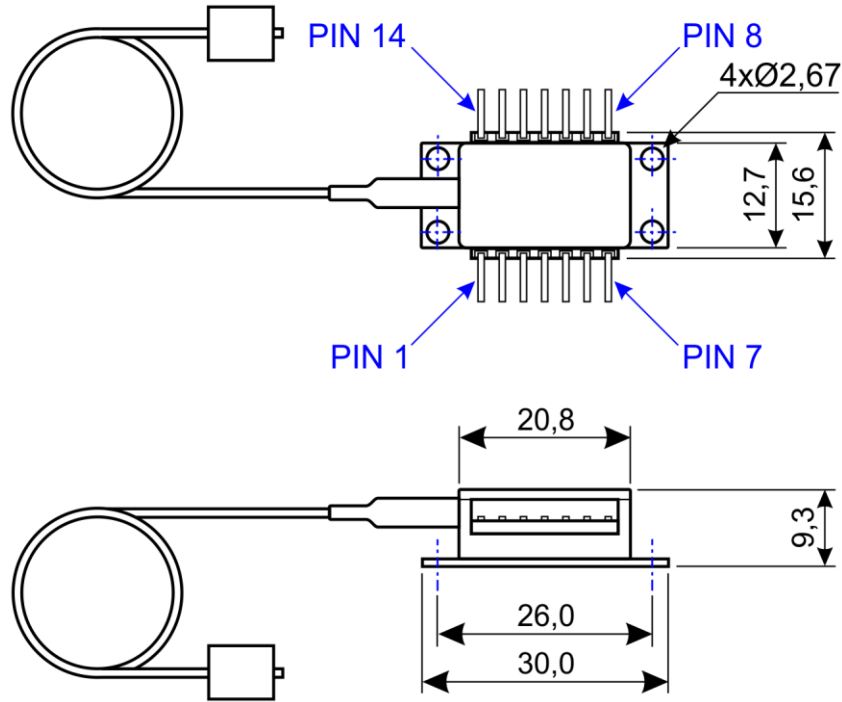


Power vs. Operating Current



Package Specification

Housing drawing



| Pin No. | Pin Information |
|---------|-------------------------|
| 1 | Thermistor |
| 2 | Thermistor |
| 3 | Laser cathode |
| 4 | NC |
| 5 | NC |
| 6 | Thermoelectric cooler + |
| 7 | Thermoelectric cooler - |
| 8 | Case ground |
| 9 | Case ground |
| 10 | NC |
| 11 | Laser anode |
| 12 | Laser cathode |
| 13 | Laser anode |
| 14 | NC |