

Features

- High power: up to 200 mW
- Low power dissipation
- Mini-DIL form factor
- PM fiber

Applications

- FOGs
- SDH/Single Channel EDFAs
- Small form factor amplifiers
- Gain Blocks

Ordering Information

| Part | λ_c [nm] | Fiber |
|-------|------------------|-------|
| EM278 | 976 | PM |

General Description

The EM4 278 single mode, uncooled 976 nm pump lasers simplifies next generation erbium doped fiber amplifier (EDFA) designs by eliminating the need for large, less efficient, and costlier electric supplies. It is wavelength stabilized by a fiber Bragg grating (FBG) which maintains stable performance over temperature ranges of 10 to 75 °C and power ranges of 50 to 200 mW.

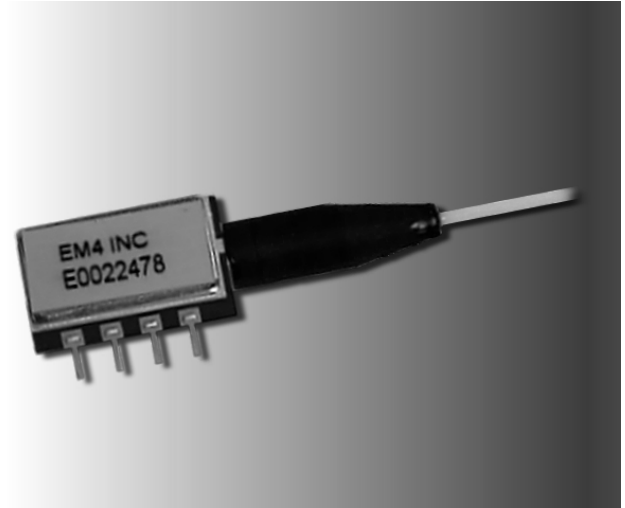
The hermetically sealed 8 pin mini-DIL package includes thermistor, monitor photodiode and UniDry™ getter. The fiber Bragg grating precisely locks the center wavelength over extended power and temperature range. By eliminating the thermoelectric cooler, next generation EDFA designs, particularly the thermal and control circuitry, benefit from the pump modules smaller size and lower power consumption.

Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only and operation of the device at these or conditions beyond these are not implied. Exposure to absolute maximum ratings for extended periods of time may affect device reliability.

| Parameter | Sym | Condition | Min | Max | Unit |
|-----------------------------|------------------|-----------|-----|-----|------|
| Storage Temperature | T _{STG} | | -40 | 85 | °C |
| Operating Case Temperature | T _{OP} | | -5 | 75 | °C |
| Laser Forward Current | I _F | | | 780 | mA |
| Laser Reverse Voltage | V _R | | | 2.0 | V |
| Photo Diode Forward Current | I _{PD} | | | 10 | mA |
| Photo diode Reverse Voltage | V _{PD} | | | 20 | V |
| Thermistor Current | | | | 2 | mA |
| Thermistor Voltage | | | | 5 | V |
| Lead Soldering Time | | | | 10 | s |
| Lead Soldering temperature | | | | 250 | °C |
| Fiber Pull Force | | | | 5 | N |
| Fiber Bend Radius | | | 25 | | mm |
| ESD | | HBM | | 500 | V |

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Uncooled mini-DIL Pump Laser

Optical And Electrical Characteristics

T_{OP}=25°C, T_{grating} = 23±3 °C and beginning of life unless otherwise specified.

| Parameter | Sym. | Condition | Min | Typ. | Max | Unit |
|----------------------------------|-------------------|------------------------------|------|-------|-------|-------|
| Operating Package Temperature | T _{CHIP} | | 10 | | 75 | °C |
| External Return Reflection | | | | | -50 | dB |
| Minimum Operating Power | P _{MIN} | | 50 | | | mW |
| Operating Power | P _{OP} | | | | 200 | mW |
| Threshold Current | I _{TH} | | | | 55 | mA |
| Laser Operating Drive Current | I _{OP} | P=P _{OP} =200mW | | 500 | 600 | mA |
| Laser Forward Voltage | V _F | I=I _{MAX} | | | 2.1 | V |
| KINK Power | P _{KINK} | I=I _{KINK} | 240 | | | mW |
| KINK Current | I _{KINK} | P=P _{KINK} | | | 715 | mA |
| Center Wavelength | λ _C | P=P _{OP} | 975 | 976 | 977 | nm |
| Spectral Shift With Temperature | Δλ/ΔT | | | | 0.02 | nm/°C |
| Power In Band | | @λ _C ±1nm, P>50mW | 90 | | | % |
| Side Mode Suppression | SMSR | P=P _{OP} | 30 | | | dB |
| Monitor Photo Diode Current | I _{PD} | P=P _{OP} | 0.1 | | 6.0 | mA |
| Monitor Photo Diode Dark Current | I _D | | | | 100 | nA |
| Thermistor Resistance | R _{TH} | T=25°C | 9500 | 10000 | 10500 | Ω |
| Thermistor β coefficient | β | 0 / 50°C | | 3892 | | |

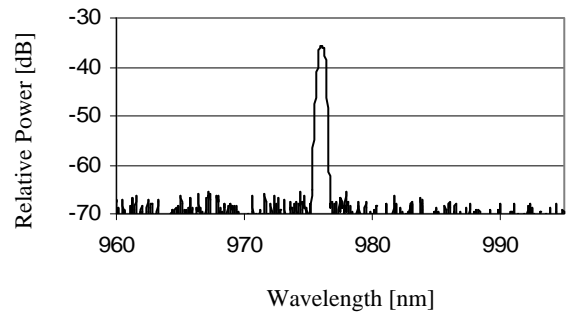
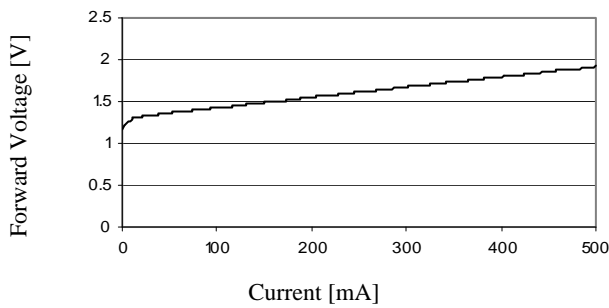
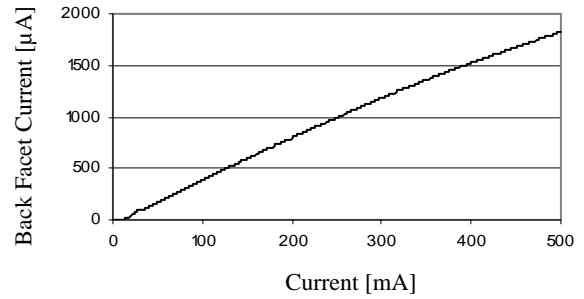
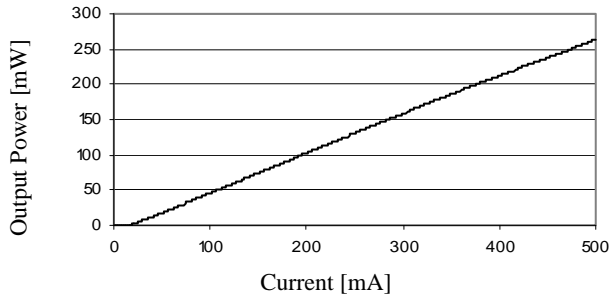
Fiber Specification

| Parameter | Sym | Condition | Min | Typ. | Max | Unit |
|-----------------------------|-----|-----------|-----------------|------|-----|------|
| Fiber Type | | | PM | | | |
| Jacket Material | | | Hytrel Acrylate | | | |
| Core Diameter | | | 5.6 | 6.6 | 7.6 | μm |
| Cladding Diameter | | | 123 | 125 | 127 | μm |
| Buffer Diameter | | | 230 | 245 | 260 | μm |
| Pigtail Length With Grating | | | 1.5 | 3 | | m |
| Proof Strength | | | 120 | | | kpsi |

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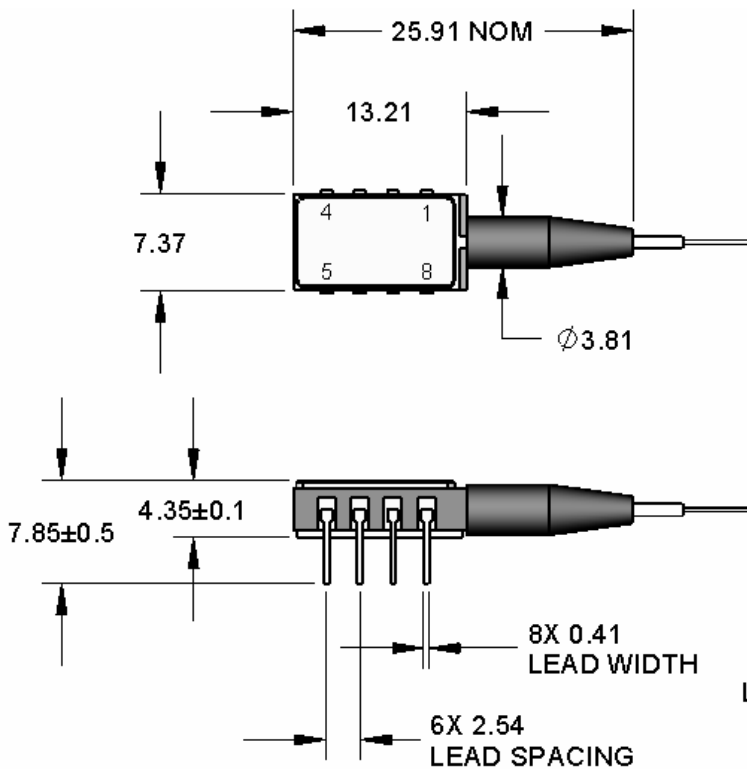
Typical Operating Characteristics

T_C=25°C



Mechanical Drawing

All units in mm



Pinning

| Pin | Description |
|-----|--------------------|
| 1 | Thermistor |
| 2 | Case GND |
| 3 | Thermistor |
| 4 | Monitor PD Cathode |
| 5 | Monitor PD Anode |
| 6 | Laser Cathode |
| 7 | Laser Anode |
| 8 | NC |

