

CM97-xxx-7x

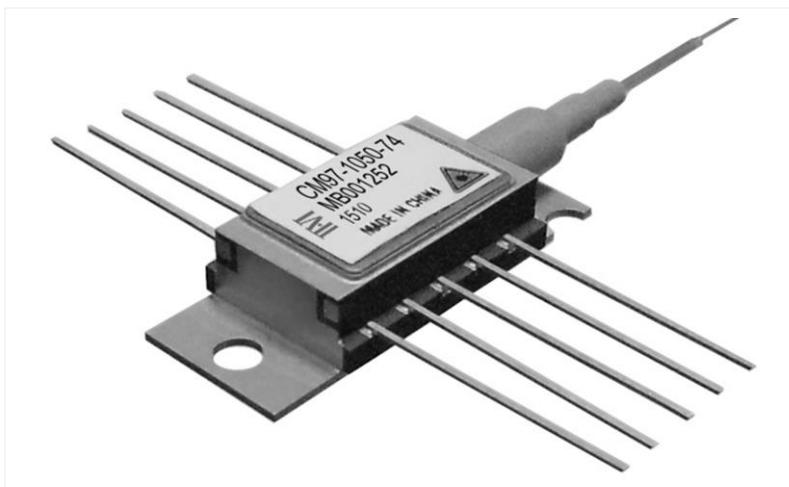
Cooled 980nm Pump Laser Module

Features

- High output power, >1.0W kink free
- Fiber Bragg grating stabilization for wavelength locking over the entire operating conditions
- Hermetically sealed 10pin mini-butterfly package
- Internal thermoelectric heatpump and monitor photodiode
- Telcordia GR-468-CORE compliant
- Field-proven high reliability
- RoHS compliant

Applications

- Low noise EDFAs
- Dense wavelength division multiplexing (DWDM) EDFAs
- CATV Applications



Product Overview

These lasers are designed as pump sources for erbium doped fiber amplifier (EDFA) applications. Processes and techniques of coupling the fiber to the laser allow very high output powers that are stable with both time and temperature.

The CM97-series pump module utilizes a fiber Bragg grating design for enhanced wavelength and power stability performance. This product has been designed to ensure superior wavelength locking over drive current and case temperature.

Devices are available with kink free output powers to >1.0W.

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Optical Characteristics

| Product Code | Kink-Free Power P_{kink} (mW) | Operating Power P_{op} (mW) | Maximum Operating Current I_{op} (mA) |
|--------------|---|---|---|
| CM97-610-7* | 610 | 555 | 855 |
| CM97-630-7* | 630 | 570 | 885 |
| CM97-650-7* | 650 | 590 | 915 |
| CM97-670-7* | 670 | 610 | 940 |
| CM97-690-7* | 690 | 625 | 970 |
| CM97-710-7* | 710 | 645 | 995 |
| CM97-730-7* | 730 | 665 | 1030 |
| CM97-750-7* | 750 | 680 | 1050 |
| CM97-770-7* | 770 | 700 | 1080 |
| CM97-790-7* | 790 | 720 | 1105 |
| CM97-810-7* | 810 | 735 | 1135 |
| CM97-830-7* | 830 | 755 | 1165 |
| CM97-850-7* | 850 | 775 | 1190 |
| CM97-870-7* | 870 | 790 | 1215 |
| CM97-890-7* | 890 | 810 | 1245 |
| CM97-910-7* | 910 | 830 | 1275 |
| CM97-930-7* | 930 | 845 | 1300 |
| CM97-950-7* | 950 | 865 | 1330 |
| CM97-970-7* | 970 | 880 | 1360 |
| CM97-990-7* | 990 | 900 | 1360 |
| CM97-1010-7* | 1010 | 920 | 1360 |
| CM97-1030-7* | 1030 | 935 | 1360 |
| CM97-1050-7* | 1050 | 955 | 1360 |

Wavelength Specification

| Product Code | Min. | Typ. | Max. | Units | Condition |
|--------------|------|------|------|-------|---|
| CM97-xxx-74 | 973 | 974 | 975 | nm | Air reference. FBG temperature is @ 25°C. |
| CM97-xxx-76 | 975 | 976 | 977 | | |

Notes;

1. Conditions unless otherwise stated: Case temperature -20 to 75°C, Submount temperature 25°C (at any given case temperature), Monitor diode bias -5V, CW operation
2. Operating power assumes a 10% ageing margin: Operating Power = Kink-Free Power/1.1

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Product Specification

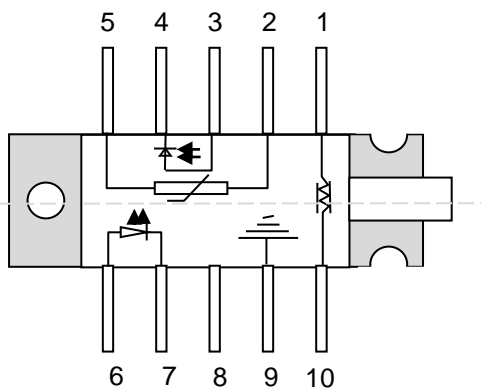
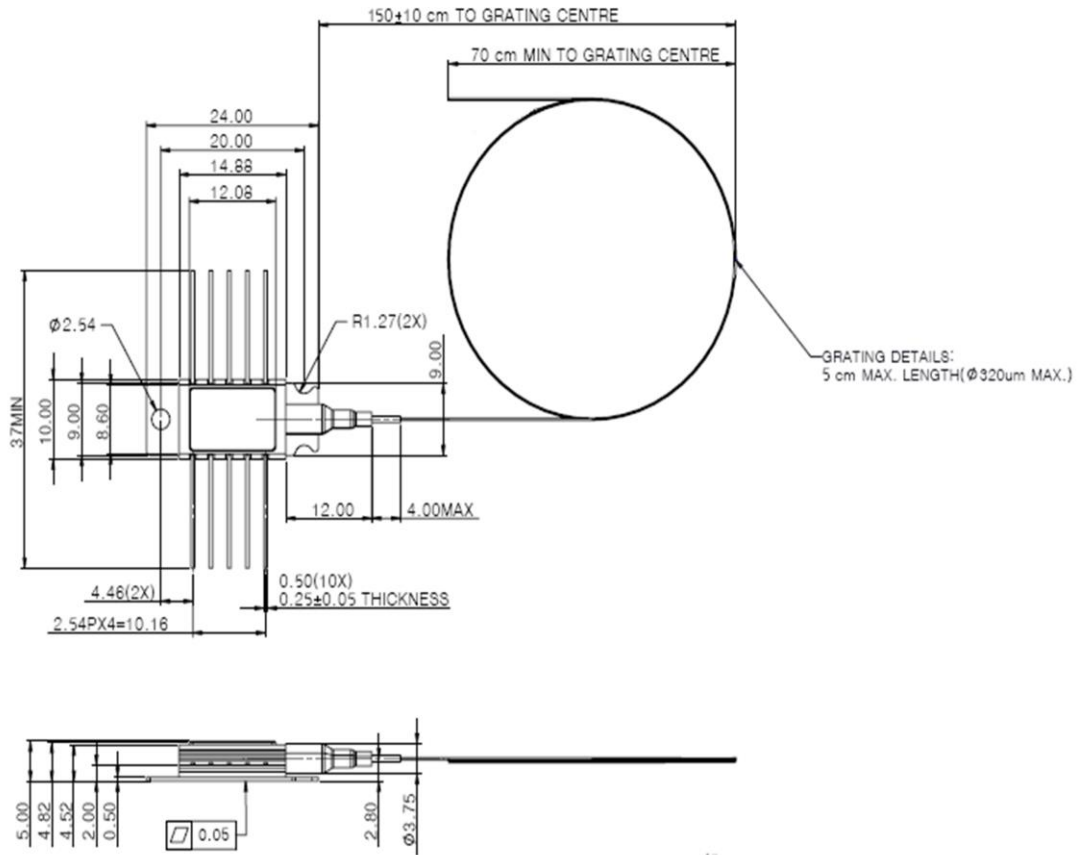
| Parameter | | Min. | Typ. | Max. | Units | Condition |
|--|--------------------------|------|-------|----------------------|------------|---|
| Threshold current | I_{th} | | 60 | 80 | mA | |
| Maximum Kink Free Current | $I_{kink} @ P_{kink}$ | | | 1500 | mA | |
| Operating forward voltage | V_{op} | | 2.0 | 2.2 | V | |
| Spectral width | $\Delta\lambda$ | | 0.2 | 1.0 | nm | RMS at -13dB |
| Signal to noise ratio | SNR | 20 | | | dB | |
| Temperature dependence of peak wavelength | $\Delta\lambda/\Delta T$ | | 0.008 | 0.01 | nm/°C | FBG temperature dependency |
| Monitor detector responsivity | R_m | 1 | | 10 | $\mu A/mW$ | @ -5V bias voltage |
| Monitor dark current | I_{dark} | | | 50 | nA | |
| Fibre power stability >50mW 30 – 50mW 10 – 30mW | ΔP_{f_t} | | | 0.05 0.15 0.35 | dB | Peak-to-peak Time = 60sec DC to 50kHz |
| Return loss | RL | 8 | | | dB | 1500nm – 1600nm |
| Thermistor BETA value | β | 3500 | 3575 | 4100 | | $\pm 1\%$ temperature variation |
| Thermistor resistance | R_{th} | 9.5 | 10.0 | 10.5 | k Ω | At submount temperature of 25°C |
| Heat pump current | I_{TEC} | | | 2.0 | A | T _{case} = 75°C, IF= 1500mA |
| Heat pump voltage | V_{TEC} | | | 3.0 | V | |

Absolute Maximum Rating

| Parameter | | Min. | Typ. | Max. | Units | Condition |
|-------------------------------|-------------------|------|------|------|---------|--|
| Operating case temperature | T_{op} | -20 | | 75 | °C | |
| Storage temperature | T_{stg} | -40 | | 85 | °C | |
| Storage relative humidity | RH _{stg} | 5 | | 95 | % | But not to exceed 0.024kg of water per 1.0kg of dry air |
| Operating relative humidity | RH _{op} | 5 | | 85 | % | |
| Pigtail axial pull force | | | | 0.5 | kg | 1 minute |
| Pigtail side pull force | | | | 0.25 | kg | 90°, 4 directions, 5s |
| Fibre bend radius | | 13 | | | mm | |
| Lead soldering temperature | | | | 350 | °C | 10 sec |
| Laser diode forward current | I_{f_max} | | | 1500 | mA | CW |
| Laser diode current transient | | | | 1500 | mA | Time = 1000ns max. |
| Laser diode reverse current | I_r | | | 10 | μA | |
| Laser diode reverse voltage | V_r | | | 2.0 | V | |
| Heat pump current | I_{TEC} | -2.5 | | 2.5 | A | Thermistor and TEC must be in closed loop control at all times |
| Heat pump voltage | V_{TEC} | -3.3 | | 3.3 | V | |

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Module Outline Drawing and Pin Connections



| Pin | Description | Pin | Description |
|-----|---------------------|-----|-------------------|
| 1 | TEC (+) | 6 | Laser anode (+) |
| 2 | Thermistor | 7 | Laser cathode (-) |
| 3 | Monitor anode (-) | 8 | NC |
| 4 | Monitor cathode (+) | 9 | Package ground |
| 5 | Thermistor | 10 | TEC (-) |

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Fibre Specification

| Parameter | Min. | Typ. | Max. | Units | Condition |
|--------------------------------|--------|------|-------|-------|--|
| Fibre type | HI1060 | | | | |
| Cut-off wavelength | 870 | 920 | 970 | nm | |
| Mode field diameter | 5.6 | 5.9 | 6.2 | µm | @ 980nm |
| Cladding diameter | 124.5 | 125 | 125.5 | µm | |
| Fibre coating diameter | 230 | 245 | 260 | µm | Acrylate material, mechanically strippable |
| Grating recoat diameter | 260 | 280 | 320 | µm | |
| Core/cladding concentricity | | | <0.5 | µm | |
| Coating-clad offset | | | ≤5 | µm | |
| Fibre proof test | 200 | | | kpsi | |
| Fibre Bragg Grating proof test | 150 | | | kpsi | |

Note; Fibre termination; bare fibre with rough cleave.

Ordering Information

| | | | | | |
|--------------|-----------|---|-----------------|---|--|
| CM | 97 | - | xxx | - | 7x |
| Product Type | Chip Type | - | Kink Free Power | - | Wavelength 74 for 974nm 76 for 976nm |

Example: CM97-550-74 is a 550mW KFP; 974nm product.

Contact Information

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RoHS Compliance



II-VI Photonics is fully committed to environment protection and sustainable development and has set in place a comprehensive program for removing polluting and hazardous substances from all of its products. The relevant evidence of RoHS compliance is held as part of our controlled documentation for each of our compliant products. RoHS compliance parts are available to order, please refer to the ordering information section for further details.

User Safety

The laser light is invisible and maybe harmful to human eyes. ESD protection, it is important that devices are handled correctly during all stages of manufacture and use.



Caution - use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Important Notice

Performance figures, data and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing by II-VI Photonics before they become applicable to any particular order or contract. In accordance with the II-VI Photonics policy of continuous improvement specifications may change without notice. Further details are available from any II-VI Photonics sales representative.

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