

# 980nm Pump Laser Module, Uncooled LU9\*\*X

The Bookham LU9\*\*X 980nm Pump Laser Module is the second generation uncooled pump module providing higher power for highly reliable amplification for metro, cross-connect or other single/multi-channel amplification applications. The LU9\*\*X uses a Mini-DIL package enabling low-cost and small form-factor. The G07 ridge-waveguide laser diode inside has been designed for uncooled operation at high temperature and power levels. Submarine qualification of the G07 chip ensures high reliability even at 200mW, 70°C. External Fiber Bragg Grating (FBG) stabilization provides excellent wavelength and power stability over the entire temperature operating range.

#### Features:

- Operating temperature range from 0°C to +70°C (case)
- 120 240mW linear power range over full temperature range
- Polarization maintaining (PM) fiber
- Low power dissipation
- Mini-DIL housing for small size
- G07 ridge-waveguide laser chip inside with Telecom reliability
- · Wavelength stabilized by fiber Bragg grating over entire operating range
- Center wavelength at 974, 976 and 980nm
- Telecordia GR-468-CORE compliant
- RoHS compliant



### **Applications:**

• EDFA's or EWDA's requiring low-to-medium power 980nm pump modules with low power consumption, small form-factor and low cost





## **Characteristics**

# Operating Characteristics at Beginning of Life (BOL)

| Parameter                  | Min | Тур               | Max                                                                | Unit  | Conditions                                                                                                                                                   |
|----------------------------|-----|-------------------|--------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Laser diode                |     |                   |                                                                    |       |                                                                                                                                                              |
| Operating case temperature | 0   |                   | 70                                                                 | °C    |                                                                                                                                                              |
| Threshold current          |     | 50                | 70                                                                 | mA    | 70°C                                                                                                                                                         |
| Centre wavelength          |     | 974<br>976<br>980 |                                                                    | nm    | 0 - 70°C (case)<br>FBG Stabilized                                                                                                                            |
| Operating voltage          |     | 1.75              | 2.2                                                                | V     | 200 mW, 70°C                                                                                                                                                 |
| Operating current          |     |                   | 320<br>345<br>370<br>395<br>420<br>445<br>475<br>500<br>525<br>550 | mA    | 100 mW, 70°C<br>110 mW, 70°C<br>120 mW, 70°C<br>130 mW, 70°C<br>140 mW, 70°C<br>150 mW, 70°C<br>160 mW, 70°C<br>170 mW, 70°C<br>180 mW, 70°C<br>190 mW, 70°C |
| Total power consumption    |     | 0.8               | 1.2                                                                | W     | 200 mW, 70°C                                                                                                                                                 |
| Power variation            |     | 0.1               | 0.15                                                               | dB    | 0 - 70°C, 10 - 240 mW                                                                                                                                        |
| Power-in-band ratio        | 90  |                   |                                                                    | %     | 9xx ± 1.5 nm, 0 - 70°C                                                                                                                                       |
| Monitor diode              |     |                   |                                                                    |       |                                                                                                                                                              |
| Photodiode bias            |     | -5                |                                                                    | V     |                                                                                                                                                              |
| Photodiode dark current    |     |                   | 5                                                                  | nA    |                                                                                                                                                              |
| Photodiode responsivity    | 0.3 | 1.1               | 15                                                                 | μA/mW | 70°C                                                                                                                                                         |

#### Notes:

Monitor diode for alarm and diagnostic purposes only.



# **Absolute Maximum Ratings**

The absolute maximum ratings are conditions applied to the units for which the units are expected to recover fully their specified performance, unless otherwise stated. Typical test environment is normal laboratory or manufacturing area ambient conditions except as indicated differently.

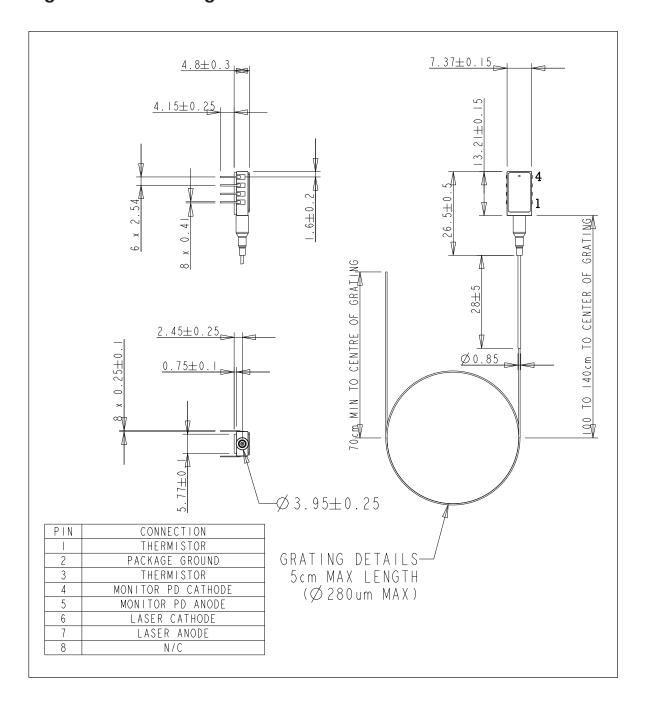
| Parameter                  | Min | Тур | Max               | Unit           | Conditions                                  |
|----------------------------|-----|-----|-------------------|----------------|---------------------------------------------|
| Storage Temperature        | -40 |     | +85               | °C             | non-condensing                              |
| Lead Soldering Temperature |     |     | 200               | °C             | For 10 seconds                              |
| ESD damage                 |     |     | 500               | V              | HBM, C = 100 pF, R = 1.5 kW                 |
| LD forward drive current   |     |     | 900<br>900<br>800 | mA<br>mA<br>mA | Tcase = 0°C<br>Tcase = 25°C<br>Tcase = 70°C |
| LD reverse voltage         |     |     | 2.5               | V              |                                             |
| LD reverse current         |     |     | 0.01              | mA             |                                             |
| LD operating temperature   | 0   |     | 70                | °C             |                                             |
| PD reverse voltage         |     |     | 20                | V              |                                             |
| PD reverse current         |     |     | 5                 | mA             |                                             |
| Relative Humidity          | 5   |     | 95                | %              | Storage                                     |
|                            | 5   |     | 85                | %              | Operating                                   |
| Atmospheric Pressure       | 11  |     |                   | kPa            | Storage                                     |
|                            | 85  |     |                   | kPa            | Operating                                   |

# **Fiber Pigtail**

| Parameter                | Min | Тур | Max | Unit | Comments                                                  |
|--------------------------|-----|-----|-----|------|-----------------------------------------------------------|
| Fiber type               |     |     |     |      | Polarization Maintaining<br>Nufern PM980-HP or equivalent |
| Buffer diameter          | 230 | 250 | 270 | mm   |                                                           |
| Recoating diameter       |     |     | 300 | mm   |                                                           |
| Pigtail length after FBG | 0.7 |     |     | m    |                                                           |
| Module to FBG length     | 1.0 | 1.2 | 1.4 | m    |                                                           |
| Splice & FBG proof test  | 150 |     |     | kpsi |                                                           |
| Fiber pull to housing    | 10  |     |     | N    |                                                           |



# **Package Outline Drawing and Dimensions**





### **Power Levels**

| Product Code | Operating Power (EOL) (mW) | Kink free power (mW) |
|--------------|----------------------------|----------------------|
| LU9xxC-R     | 100                        | 120                  |
| LU9xxD-R     | 110                        | 132                  |
| LU9xxE-R     | 120                        | 144                  |
| LU9xxF-R     | 130                        | 156                  |
| LU9xxG-R     | 140                        | 168                  |
| LU9xxH-R     | 150                        | 180                  |
| LU9xxJ-R     | 160                        | 192                  |
| LU9xxK-R     | 170                        | 204                  |
| LU9xxL-R     | 180                        | 216                  |
| LU9xxM-R     | 190                        | 228                  |
| LU9xxN-R     | 200                        | 240                  |

### **RoHS Compliance**





Bookham 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.

### **Ordering Information:**

LU974C-R to LU974N-R 974nm Pump Laser Module,

Uncooled – Mini-DIL series

LU976C-R to LU976N-R 976nm Pump Laser Module,

Uncooled - Mini-DIL series

LU980C-R to LU980N-R 980nm Pump Laser Module, Uncooled – Mini-DIL series

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