

High Power Uncooled 980nm Pump Laser Module in 10-Pin mini-BTF Package LU96*-10R Series

Features:

- Up to 500mW kink-free power over full operating temperature range
- Operating temperature range from -5°C to +75°C (case)
- Polarization maintaining (PM) fibre
- Low power dissipation
- Small form factor package compatible with 14pin BTF pin footprint and pinout
- Wavelength stabilized by fibre Bragg grating over entire operating range
- Centre wavelength at 974 and 976nm
- Telcordia GR-468-CORE compliant
- RoHS compliant 

Applications:

- Low noise EDFA requiring higher optical power with low power consumption and small form-factor package
- Single or multi-stage applications including Mid-stage Access (MSA), Dense Wavelength Division Multiplexing (DWDM)



The high power, extended temperature LU96*-10R series uncooled laser module in a 10-Pin mini-BTF package is Oclaro's third generation uncooled pump module providing higher powers and lower consumption for highly reliable metro, cross-connect, SFF single or multi-channel applications plus 40Gb/s per-channel amplification.

The LU96*-10R series uses a 10-pin mini-BTF package enabling smaller form factor designs, with mounting holes for ease of integration and thermal management.

The G08EL ridge-waveguide laser diode inside has been designed for uncooled operation at high temperature and power levels. Qualification of the enhanced G08 chip ensures high reliability even at 500mW operating power, 75°C. External Fiber Bragg Grating (FBG) stabilization provides excellent wavelength and power stability over the entire operating temperature range.

Operating Characteristics

Conditions unless otherwise stated: Case temperature -5 to +75°C
 Monitor diode bias -5V
 CW operation

Product Code	Kink-free Power	Operating Power	Product Code	Kink-free Power	Operating Power
LU96A74E-10R	310mW	280mW	LU96M74E-10R	430mW	390mW
LU96B74E-10R	320mW	290mW	LU96N74E-10R	440mW	400mW
LU96C74E-10R	330mW	300mW	LU96P74E-10R	450mW	410mW
LU96D74E-10R	340mW	310mW	LU96R74E-10R	465mW	420mW
LU96E74E-10R	350mW	320mW	LU96S74E-10R	475mW	430mW
LU96F74E-10R	360mW	330mW	LU96T74E-10R	485mW	440mW
LU96G74E-10R	375mW	340mW	LU96U74E-10R	500mW	450mW
LU96H74E-10R	385mW	350mW	LU96V74E-10R	510mW	460mW
LU96J74E-10R	400mW	360mW			
LU96K74E-10R	410mW	370mW			
LU96L74E-10R	420mW	380mW			

Operating power assumes a 10% ageing margin: Kink-Free Power (to the nearest 5mw) = 1.1 x Operating Power
 Codes shown are for 974nm variant. For other wavelength options, see ordering information

Parameter	Symbol	Measurement Conditions	Min	Typ	Max	Unit
Threshold current	I _{th}	75°C case		55	100	mA
Operating current for specified operating power: at 75°C	I _{op}	280mW 290mW 300mW 310mW 320mW 330mW 340mW 350mW 360mW 370mW 380mW 390mW 400mW 410mW 420mW 430mW 440mW 450mW 460mW		560 585 600 615 630 655 670 690 710 730 745 765 780 805 820 840 860 885 905 925 940 965 985	620 645 665 675 695 720 740 760 780 805 820 840 860 885 905 925 940 965 985	mA
Operating forward voltage	V _{op}	985mA, 75°C		1.75	2.0	V
Center wavelength	λ _c	-5 to 75°C >50mW	973 975	974 976	975 977	nm
Spectral width at -13dB	Δλ			0.2	1.0	nm
Power in band ratio	PIBR	λ _c ±1.5nm; -5°C to 75°C >100mW 50mW to 100mW	90 75			%

Parameter	Symbol	Measurement Conditions	Min	Typ	Max	Unit
Temperature dependence of peak wavelength	dλ/dT			0.02		nm/°C
Monitor diode responsivity	Rmon		0.3	6	15	μA/mA
Photodiode dark current	Idark	-5V bias, -5 to 75°C			60	nA
Fiber power stability >30mW 20 – 30mW 10 – 20mW 5 – 10mW		Peak-to-peak Time = 60sec DC to 50kHz			0.10 0.10 0.15 0.20	dB
Thermistor BETA value		±1%	3539	3575	3611	K
Thermistor resistance	Rth	At Tcase set to 25°C	9.5	10.0	10.5	kΩ
Thermal power dissipation	Pther	Tcase= 75°C, 500mW		0.75	1.2	W
Total electrical power consumption	Ptot	Tcase= 75°C, 500mW		1.5	2.0	W
Return loss	RL	1500nm - 1600nm	20dB			dB

Note:
Monitor diode for alarm and diagnostic purposes only.

Absolute Maximum Ratings

Parameter	Symbol	Measurement Conditions	Min	Max	Unit
Operating case temperature	Top		-5	75	°C
Storage temperature	Tstg	Non-condensing	-40	85	°C
Storage relative humidity	RHstg		5	95	%RH
Operating relative humidity	RHop		5	85	%RH
Pigtail axial pull force		3x10 seconds		10.0	N
Pigtail side pull force		3x10 seconds		5.0	N
Fiber bend radius			13		mm
Lead soldering temperature		10 sec		350	°C
Laser diode forward current	If max	Tcase = -5°C Tcase = 75°C		1200 1100	mA
Laser diode reverse Current	Ir max	Reverse voltage <2V		10	µA
Laser diode reverse voltage	VrevLD			2.5	V
Photodiode reverse voltage				20	V
Photodiode reverse current				5	mA
ESD threshold		HBM, C=100pF, R=1.5kΩ		500	V

Fiber Specification

Parameter	Note	Min	Typ	Max	Unit
Fiber type	Nufern PM980-HP or Corning Panda PM980, 250µm				
Fiber termination	Bare fiber, rough cleave				
Operating wavelength			980		nm
Mode field diameter	@ 980nm	5.6	6.6	7.6	µm
Beat length	@ 980nm		3.3		mm
Cladding diameter		124	125	126	µm
Fiber coating diameter	Acrylate material, mechanically strippable	230	245	260	µm
Grating recoat diameter		260	280	300	µm
Core-Clad concentricity				<0.5	µm
Coating/Clad offset				<5	µm
Fiber proof test		200			kpsi
FBG proof test		150			kpsi

Package Outline Drawing

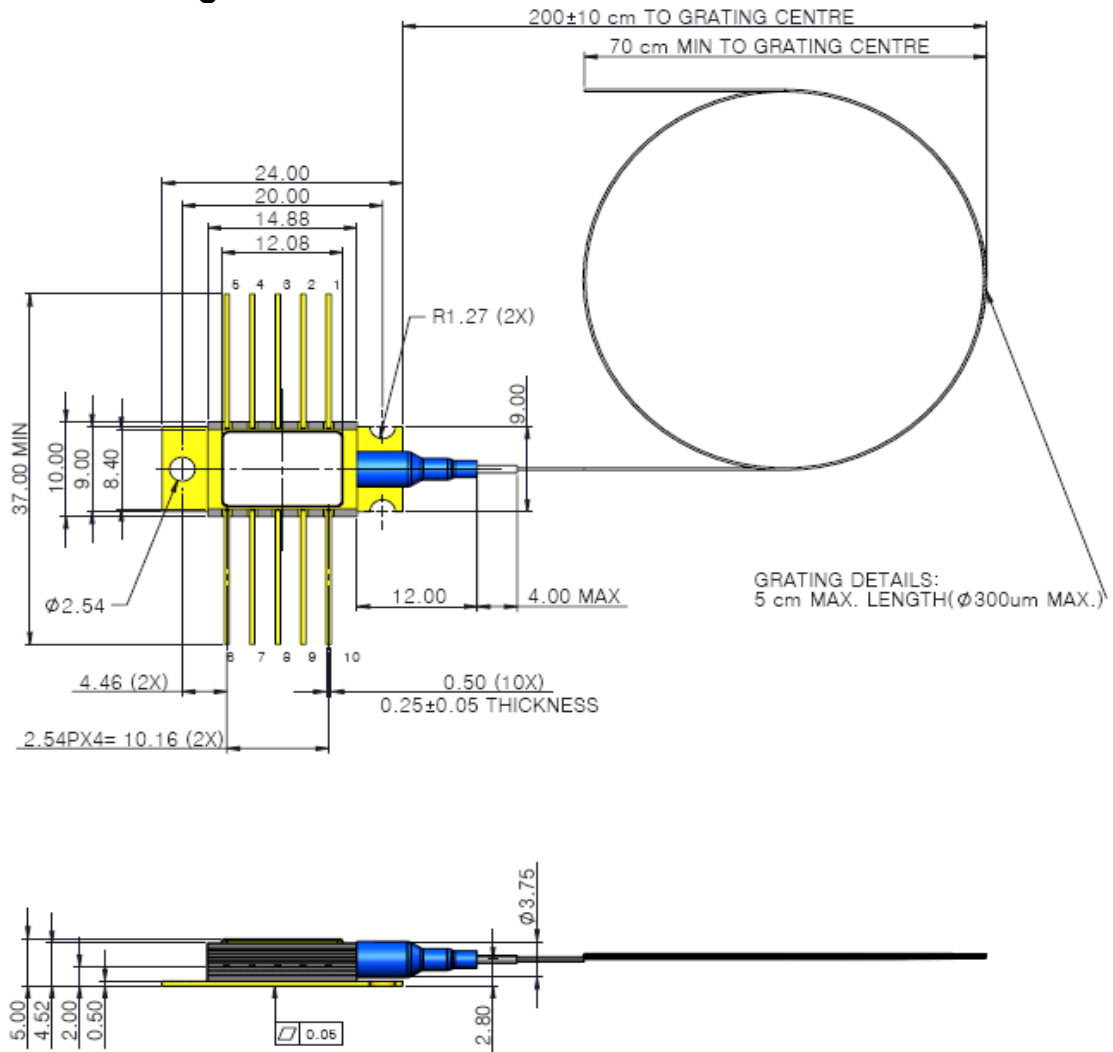


Figure 1: Package Outline Drawing and Dimensions (mm)

Pin-out Connections

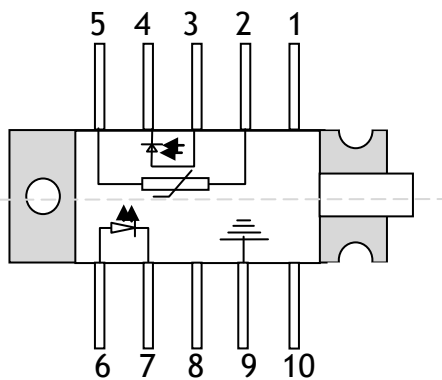


Figure 2: Pin-out Connections

Pin #	Description	Pin#	Description
1	NC	6	Laser anode (+)
2	Thermistor	7	Laser cathode (-)
3	Monitor anode (-)	8	NC
4	Monitor cathode(+)	9	PKG Ground
5	Thermistor	10	NC

RoHS Compliance



Oclaro 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 compliant parts are available to order, please refer to the ordering information section for further details.

Ordering Information

Kink-free Power	Operating power	974nm Code	976nm Code
310mW	280mW	LU96A74E-10R	LU96A76E-10R
320mW	290mW	LU96B74E-10R	LU96B76E-10R
330mW	300mW	LU96C74E-10R	LU96C76E-10R
340mW	310mW	LU96D74E-10R	LU96D76E-10R
350mW	320mW	LU96E74E-10R	LU96E76E-10R
360mW	330mW	LU96F74E-10R	LU96F76E-10R
375mW	340mW	LU96G74E-10R	LU96G76E-10R
385mW	350mW	LU96H74E-10R	LU96H76E-10R
400mW	360mW	LU96J74E-10R	LU96J76E-10R
410mW	370mW	LU96K74E-10R	LU96K76E-10R
420mW	380mW	LU96L74E-10R	LU96L76E-10R
430mW	390mW	LU96M74E-10R	LU96M76E-10R
440mW	400mW	LU96N74E-10R	LU96N76E-10R
450mW	410mW	LU96P74E-10R	LU96P76E-10R
465mW	420mW	LU96R74E-10R	LU96R76E-10R
475mW	430mW	LU96S74E-10R	LU96S76E-10R
485mW	440mW	LU96T74E-10R	LU96T76E-10R
500mW	450mW	LU96U74E-10R	LU96U76E-10R
510mW	460mW	LU96V74E-10R	LU96V76E-10R

Patents

This product is protected by US patents 6,782,024, 6,798,815, 6,837,075, 7,173,953 and 7,218,659 and other patents and applications pending worldwide.

Contact Information

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