UM96Z***-7*

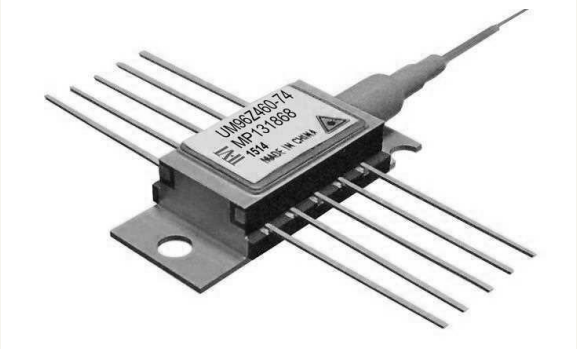
High Power Uncooled mBTF 980nm Pump Laser Module

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) fiber
- Low power dissipation
- Small form factor 10pin mini-butterfly (mBTF) package offers pinout compatibility with 14pin-BTF package
- Wavelength stabilized by fiber 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 EDFA applications including Single-channel and DWDM designs



Product Overview

The high power, extended temperature UM96Z-series uncooled laser module in a 10-Pin mBTF package is II-VI's third-generation uncooled pump module providing higher powers and lower consumption.

This laser enables designers to create reliable SFF single- and multi-channel, high bit-rate, per-channel amplification as well as replace traditional cooled pumps in high power EDFA applications with reduced power consumption.

The UM96Z-series uses a 10-pin mBTF package enabling smaller form factor designs, with mounting holes for ease of integration and thermal management. The 10-pin mBTF package is backward compatible with 14pin BTF package footprint and pinout.

The UM96Z-series is designed for uncooled operation at high temperature and power levels. Qualification of the enhanced G08 chip ensures high reliability even at 460mW operating power, 75°C. External Fiber Bragg Grating (FBG) stabilization provides excellent wavelength and power stability over the entire operating temperature range.

UM96Z-Series

Operating Parameter

Product Code	Minimum Kink-Free Power P_{kink} (mW)	Maximum Operating Power P_{op} (mW)	Typical Operating Current I_{op} (mA)	Maximum Operating Current I_{op} (mA)
UM96Z280-7*	310	280	560	635
UM96Z290-7*	320	290	585	660
UM96Z300-7*	330	300	600	680
UM96Z310-7*	340	310	615	695
UM96Z320-7*	350	320	630	715
UM96Z330-7*	365	330	655	740
UM96Z340-7*	375	340	670	760
UM96Z350-7*	385	350	690	785
UM96Z360-7*	395	360	710	805
UM96Z370-7*	405	370	730	830
UM96Z380-7*	420	380	745	845
UM96Z390-7*	430	390	765	865
UM96Z400-7*	440	400	780	885
UM96Z410-7*	450	410	805	915
UM96Z420-7*	460	420	820	930
UM96Z430-7*	475	430	840	950
UM96Z440-7*	485	440	855	970
UM96Z450-7*	495	450	875	985
UM96Z460-7*	505	460	895	1000

Notes;
1. Typical and maximum operating currents at 75°C
2. Operating power assumes a 10% ageing margin: Operating Power = Kink Free Power / 1.1

UM96Z-Series

Wavelength Specification

Product Code	Min.	Typ.	Max.	Units	Condition
UM96Zxxx-74	973	974	975	nm	Air reference. FBG temperatures is @ 25°C.
UM96Zxxx-76	975	976	977		

Product Specification

Parameter		Min.	Typ.	Max.	Units	Condition
Threshold current	Ith		55	100	mA	
Operating forward voltage	Vop		1.85	2.0	V	
Spectral width	Δλ		0.2	1.0	nm	RMS at -13dB
Power in band ratio >100mW 50mW to 100mW	PIB	 90 75			%	λc±1.5nm, -5°C to 75°C
Temperature dependence of peak wavelength	Δλ/ΔT		0.008	0.01	nm/°C	FBG temperature dependency
Monitor detector responsivity	Rm	0.3	6	15	μA/mW	
Monitor dark current	Idark			60	nA	-5V bias voltage
Fiber power stability >30mW 20 – 30mW 10 – 20mW 5 – 10mW	ΔPf_t			 0.10 0.10 0.15 0.20	dB	Peak-to-peak Time = 60sec DC to 50kHz
Return loss	RL	35			dB	1500nm – 1600nm
Thermistor BETA value	β	3500		4100		
Thermistor resistance	Rth	9.5	10.0	10.5	kΩ	At submount temperature of 25°C
Thermal power dissipation	Pthermal		1.35	1.75	W	Tcase= 75°C, 460mW
Total electrical power consumption	Ptotal		1.8	2.2	W	

Notes;
1. Conditions unless otherwise stated: Case temperature -5 to 75°C, Monitor diode bias -5V, CW operation

UM96Z-Series

Absolute Maximum Ratings

Parameter		Min.	Typ.	Max.	Units	Condition
Operating case temperature	Top	-5		75	°C	
Storage temperature	Tstg	-40		85	°C	
Storage relative humidity	RHstg	5		95	%	But not to exceed 0.024kg of water per 1.0kg of dry air
Operating relative humidity	RHop	5		85	%	
Pigtail axial pull force				10.0	N	3x10 seconds
Pigtail side pull force				5.0	N	3x10 seconds
Fiber bend radius		13			mm	
Lead soldering temperature				350	°C	10 sec
Laser diode forward current	If_max			1100	mA	CW
Laser diode current transient				1200	mA	Time = 1000ns max.
Laser diode reverse current	Ir			10	µA	
Laser diode reverse voltage	Vr			2.0	V	
Photodiode reverse voltage				20	V	
Photodiode reverse current				5	mA	
ESD threshold				500	V	HBM, C=100pF, R=1.5kΩ

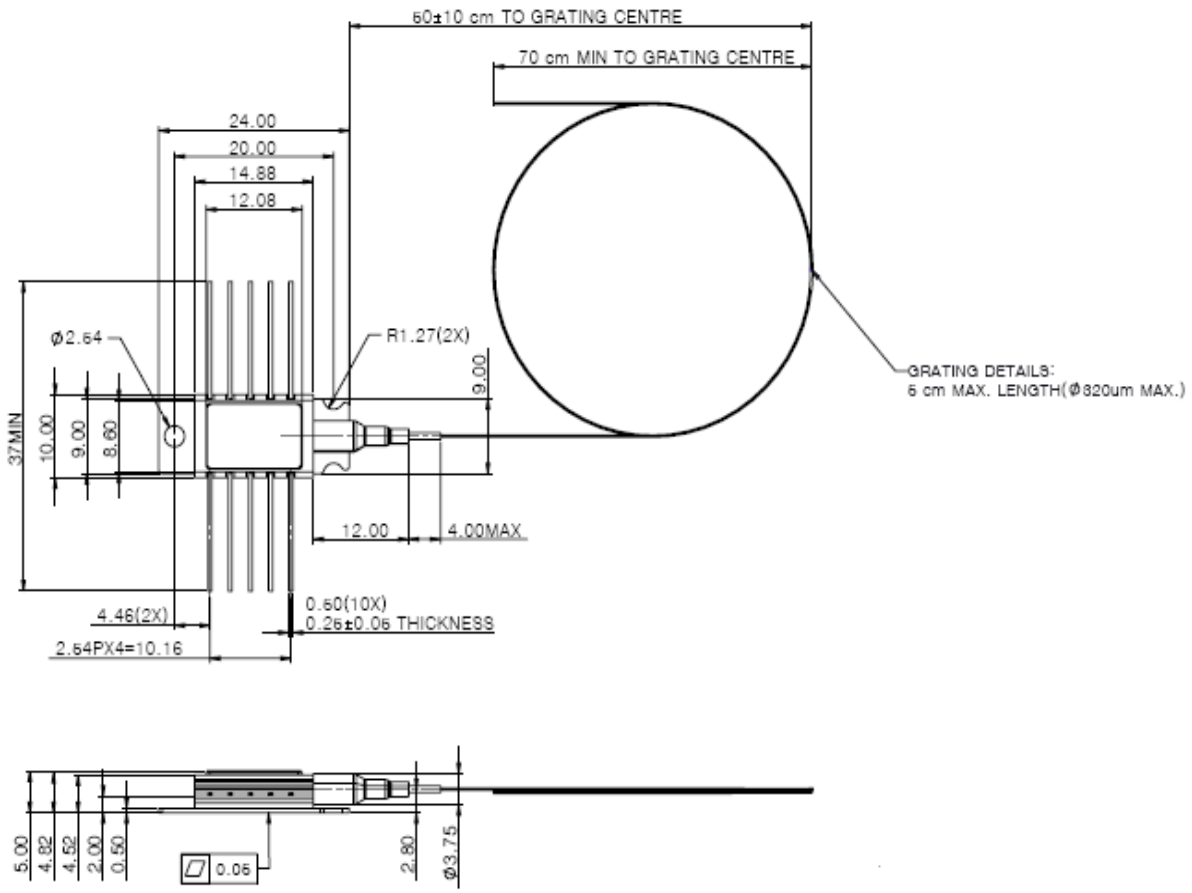
Fiber Specification

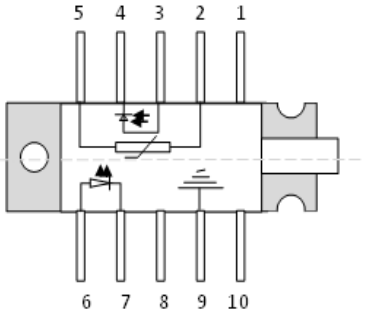
Parameter	Min.	Typ.	Max.	Units	Condition
Fiber type	Nufern PM980-XP or Corning PM 98-U25				
Cut-off wavelength	870	920	970	nm	
Mode field diameter	6.1	6.6	7.1	µm	@ 980nm
Cladding diameter	124	125	126	µm	
Fiber coating diameter	230	245	260	µm	Acrylate material, mechanically strippable
Grating recoat diameter	260	290	320	µm	
Core/cladding concentricity			<0.5	µm	
Coating-clad offset			≤5	µm	
Fiber proof test	200			kpsi	
Fiber Bragg Grating proof test	150			kpsi	

Notes;
1. Fiber termination; bare fiber with rough cleave.

UM96Z-Series

Module Outlines Drawing and Pin Connections





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

UM96Z-Series

Ordering Information

UM	96Z	xxx	-	7x
Product Type	Chip Type	LD Operating Power (mW)	-	Wavelength 74 for 974nm 76 for 976nm

Example: UM96Z310-74 is a 310mW Operating Power, 974nm product.

Contact Information

II-VI Photonics

Pump Laser Division

Westfield Business Park, Long Road
Paignton, Devon TQ4 7AU, United Kingdom

Photonics.Sales@ii-vi.com

www.ii-vi-photonics.com

UM96Z-Series

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.

THIS PRODUCT COMPLIES WITH 21CFR 1040.10

REFERENCE IEC 60825-1 Edition 2.0

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.

This product is protected by patents and patent applications pending worldwide