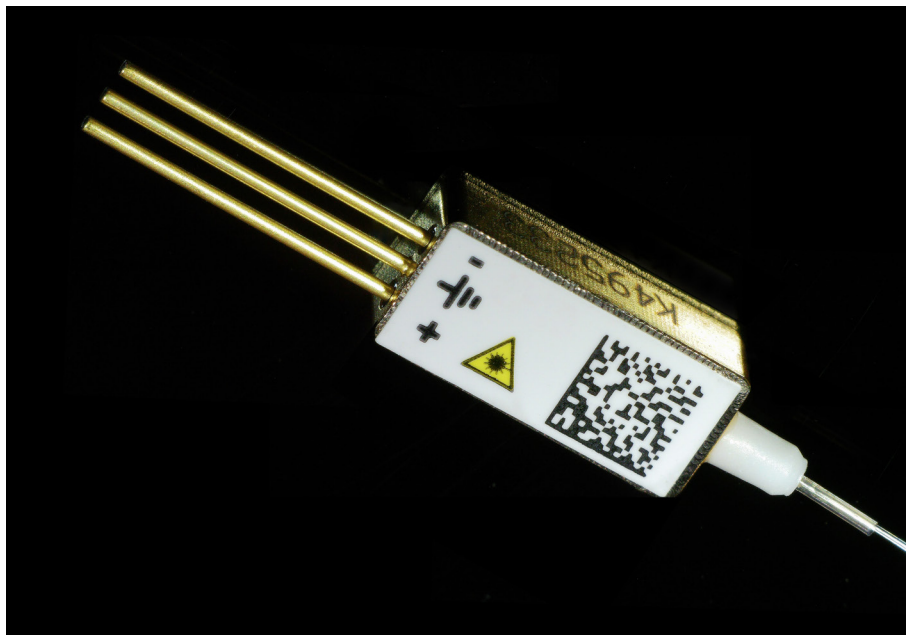



MICRO-FORMAT UNCOOLED 980 nm PUMP LASER DIODE MODULE

MLU96Z***-7*H

The Coherent MLU96Z***-7*H-series uncooled pump laser module represents continuing innovation in packaging technology to enable highly reliable pump laser sources for existing and emerging applications.



FEATURES

- Ultra-small package footprint: 10 x 4.4 x 3.2 mm (LxWxH)
- Up to 300 mW kink-free power over full operating temperature range
- 80°C operating temperature range
- Low power consumption
- Low bend-loss, 125 μ m, HI1060 fiber supporting 7 mm bend radius
- Wavelength stabilized by fiber Bragg grating over entire operating range
- Centre wavelength at 974 or 976 nm
- Telcordia GR-468-CORE compliant
- RoHS compliant 

APPLICATIONS

- Integrated amplification within high bit-rate transceiver modules
- Low noise EDFA requiring higher optical power with low power consumption and small formfactor package
- Single or multi-stage EDFA applications including Single-channel and DWDM designs

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Housed within an ultra-compact 3-pin micro-format package with a volume of just 141 mm³, the laser module enables equivalent performance to the Coherent leading 8-pin uncooled mini-DIL products.

The laser module provides designers of ultra-compact integrated amplifier systems with the tools to enable low- noise, high power optical amplification within package volumes previously unachievable.

Combining a small package volume, 1 mm fibre feed-through, and low bend-loss HI1060 SM fibre, the module can enable integrated optical amplification within small form-factor platforms such as CFP2 and CFP4.

With <1 W typical power consumption, and supporting an 80°C operating temperature range, the MLU96Z***-7*H series pump fits within tight power-consumption budgets and environmental requirements.

The MLU96Z***-7*H series houses the market-proven Coherent enhanced G08 laser for superior reliability and stability, and the package is qualified to the requirements of Telcordia GR-468-CORE.

Wavelength Specification

Product Code	Min.	Typ.	Max.	Units	Condition
MLU96Z***-74H	972	974	976	nm	Air reference.
MLU96Z***-76H	974	976	978		Over entire operating temperature range

Product Specification ¹

Parameter		Min.	Typ.	Max.	Units	Condition
Threshold Current	I_{th}		55	100	mA	
Operating Forward Voltage	V_{op}		1.65	1.8	V	
Spectral Width	$\Delta\lambda$		0.2	1.0	nm	RMS at -13 dB
Power in Band Ratio >100 mW 50 mW to 100 mW	PIB	90 75			%	$\lambda_c \pm 1.5$ nm, 0°C to 80°C
Fiber Power Stability >30 mW 20 – 30 mW 10 – 20 mW 5 – 10 mW	ΔP_{f-t}			0.10 0.10 0.15 0.20	dB	Peak-to-peak Time = 60 sec DC to 50 kHz
Return Loss	RL	35			dB	1500 nm – 1600 nm

Note 1: All characteristics at <-40 dB back reflection

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Optical Characteristics

Product Code	Minimum Kink-Free Power	Maximum Operating Power	Typical Operating Current	Maximum Operating Current	Total power consumption @ Max operating conditions
	P_{kink} (mW)	P_{op} (mW)	I_{op} (mA)	I_{op} (mA)	
MLU96Z100-7*H	110	100	260	330	0.46
MLU96Z110-7*H	120	110	287	355	0.50
MLU96Z120-7*H	135	120	308	385	0.54
MLU96Z130-7*H	145	130	328	410	0.57
MLU96Z140-7*H	155	140	348	440	0.61
MLU96Z150-7*H	165	150	369	465	0.66
MLU96Z160-7*H	175	160	382	490	0.70
MLU96Z170-7*H	190	170	411	520	0.75
MLU96Z180-7*H	200	180	432	545	0.79
MLU96Z190-7*H	210	190	453	570	0.84
MLU96Z200-7*H	220	200	474	600	0.89
MLU96Z210-7*H	230	210	496	630	0.95
MLU96Z220-7*H	245	220	517	655	1.00
MLU96Z230-7*H	255	230	539	680	1.06
MLU96Z240-7*H	265	240	561	725	1.12
MLU96Z250-7*H	275	250	583	750	1.18
MLU96Z260-7*H	285	260	605	780	1.25
MLU96Z270-7*H	300	270	628	810	1.31

Notes;

1. Typical and maximum operating currents at 80°C

2. Operating power assumes a 10% ageing margin: Operating Power = Kink Free Power / 1.1

Absolute Maximum Ratings

Parameter		Min.	Typ.	Max.	Units	Condition
Operating Case Temperature	T_{op}	0		80	°C	
Storage Temperature	T_{stg}	-40		85	°C	
Storage Relative Humidity	RH_{stg}	5		95	%	But not to exceed 0.024 kg of water per 1.0 kg of dry air
Operating Relative Humidity	RH_{op}	5		85	%	
Pigtail Axial Pull Force				0.25	kg	1 minute
Fiber Bend Radius		7			mm	
Lead Soldering Temperature				350	°C	10 sec
Laser Diode Forward Current	$I_{\text{f,max}}$			1100	mA	
Laser Diode Current Transient				1200	mA	Time = 1000 ns max
Laser Diode Reverse Current	I_{r}			10	μA	
Laser Diode Reverse Voltage	V_{r}			2.0	V	
ESD Threshold				500	V	HBM, C = 100 pF, R = 1.5 kΩ

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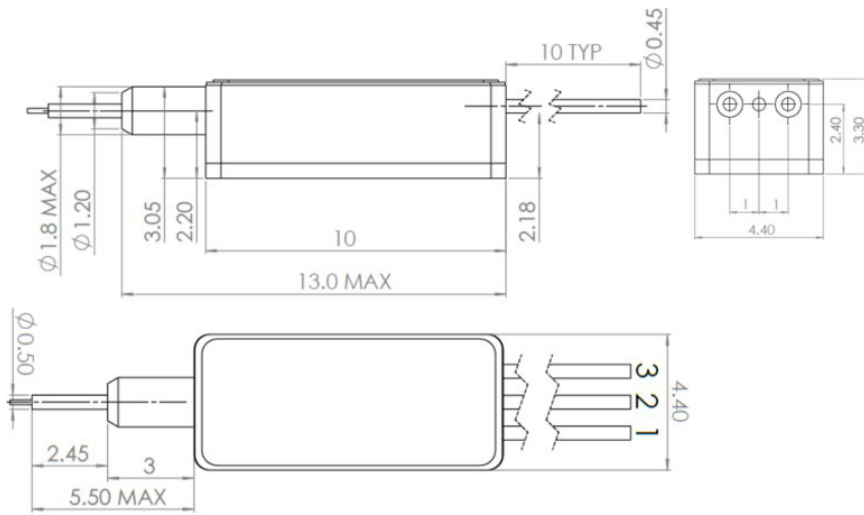
Fiber Specification

Parameter	Min.	Typ.	Max.	Units	Condition
Fiber Type	HI1060 Fibre				
Cut-off Wavelength	870		970	nm	
Mode Field Diameter	5.6	5.9	6.2	μm	@ 980nm
Cladding Diameter	124.5	125	125.5	μm	
Fiber Coating Diameter	235	245	255	μm	Acrylate material, mechanically strippable
Core/cladding Concentricity			<0.3	μm	
Fiber Proof Test	200			kpsi	
Fibre Length	750			mm	No re-coated region along length

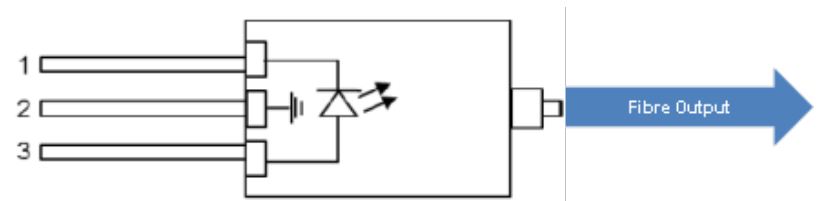
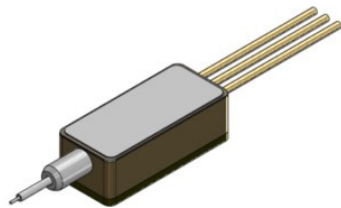
Notes:

1. Fiber termination; bare fiber with rough cleave.

Module Outline Drawing and Pin Connections



Pin	Connection
1	Laser Diode Cathode (-)
2	Package Ground
3	Laser Diode Anode (+)



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Ordering Information

MLU	96Z	***	-	7*	H
Product Type	Chip Type	LD Operating Power (mW)	-	Wavelength 74 for 974 nm 76 for 976 nm	HI1060 Fibre Pigtail

Example: MLU96Z210-74H is a 210 mW Operating Power, 974 nm product

RoHS Compliance

Coherent 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 & Product Safety

Invisible laser radiation. Avoid eye or skin exposure to direct or scattered radiation. Class 4 laser product. ESD protection. Caution. Static sensitive device. To be opened by authorised personnel only.



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 Coherent before they become applicable to any particular order or contract. In accordance with the Coherent policy of continuous improvement specifications may change without notice. Further details are available from any Coherent sales representative.

This product is protected by patents and patent applications pending worldwide.