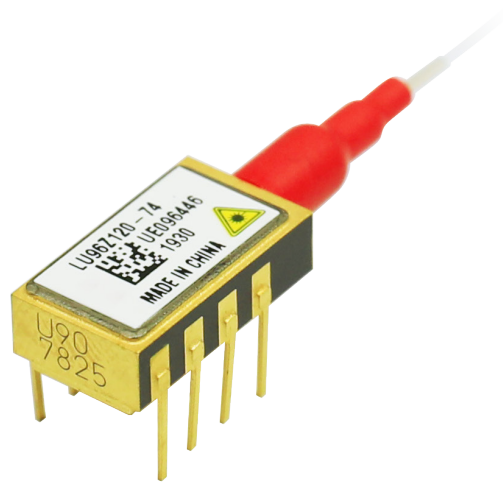


# UNCOOLED MINI-DIL 980 nm PUMP LASER MODULE


## LU96Z\*\*\*-7\*

The LU96Z-series uncooled pump laser module in an 8-pin mini-DIL package is Coherent's third-generation uncooled pump module providing low power consumption for highly reliable metro, cross-connect, SFF single and multichannel amplifier designs plus high bit-rate, per-channel amplification.

The LU96Z-series is designed for uncooled operation at high temperature and power levels. Qualification of the enhanced G08 chip ensures high reliability even at high operating power, 75°C. External Fiber Bragg Grating (FBG) stabilization provides excellent wavelength and power stability over the entire operating temperature range.



## FEATURES

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

## APPLICATIONS

- 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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## Wavelength Specification

Product Code	Min.	Typ.	Max.	Units	Condition
LU96Z***-74	973	974	975	nm	Air reference. FBG temperatures is @ 25°C.
LU96Z***-76	975	976	977		

## Product Specification

Parameter		Min.	Typ.	Max.	Units	Condition
Threshold Current	$I_{th}$		55	100	mA	
Operating Forward Voltage	$V_{op}$		1.65	2.0	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, -5°C to 75°C
Temperature Dependence of Peak Wavelength	$\Delta\lambda/T$		0.008	0.01	nm/°C	FBG temperature dependency
Monitor Detector Responsivity	$R_m$	0.3	6	15	$\mu\text{A}/\text{mW}$	
Monitor Dark Current	$I_{dark}$			60	nA	-5 V bias voltage
Fiber Power Stability >30 mW 20 – 30 mW 10 – 20 mW 5 – 10 mW	$\Delta P_{f-t}$			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
Thermistor BETA Value	$\beta$	3500		4100		
Thermistor Resistance	$R_{th}$	9.5	10.0	10.5	k $\Omega$	At submount temperature of 25°C
Thermal Power Dissipation	$P_{thermal}$		1.35	1.75	W	Tcase= 75°C, 460 mW
Total Module Power Consumption	$P_{Total}$		1.8	2.2	W	

Notes:

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

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## Optical Characteristics

Product Code	Minimum Kink-Free Power $P_{\text{kink}}$ (mW)	Maximum Operating Power $P_{\text{op}}$ (mW)	Typical Operating Current $I_{\text{op}}$ (mA)	Maximum Operating Current $I_{\text{op}}$ (mA)
LU96Z100-7*	110	100	240	270
LU96Z110-7*	120	110	255	290
LU96Z120-7*	135	120	275	310
LU96Z130-7*	145	130	295	330
LU96Z140-7*	155	140	310	350
LU96Z150-7*	165	150	330	370
LU96Z160-7*	175	160	345	390
LU96Z170-7*	190	170	360	410
LU96Z180-7*	200	180	380	430
LU96Z190-7*	210	190	395	450
LU96Z200-7*	220	200	415	470
LU96Z210-7*	230	210	430	490
LU96Z220-7*	245	220	450	510
LU96Z230-7*	255	230	470	530
LU96Z240-7*	265	240	485	550
LU96Z250-7*	275	250	505	575
LU96Z260-7*	285	260	525	595
LU96Z270-7*	300	270	545	615
LU96Z280-7*	310	280	560	635
LU96Z290-7*	320	290	585	660
LU96Z300-7*	330	300	600	680
LU96Z310-7*	340	310	615	695
LU96Z320-7*	350	320	630	715
LU96Z330-7*	365	330	655	740
LU96Z340-7*	375	340	670	760
LU96Z350-7*	385	350	690	785
LU96Z360-7*	395	360	710	805
LU96Z370-7*	405	370	730	830
LU96Z380-7*	420	380	745	845
LU96Z390-7*	430	390	765	865
LU96Z400-7*	440	400	780	885
LU96Z410-7*	450	410	805	915
LU96Z420-7*	460	420	820	930
LU96Z430-7*	475	430	840	950
LU96Z440-7*	485	440	855	970
LU96Z450-7*	495	450	875	985
LU96Z460-7*	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

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## Absolute Maximum Ratings

Parameter		Min.	Typ.	Max.	Units	Condition
Operating Case Temperature	$T_{op}$	-5		75	°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				0.5	kg	1 minute
Pigtail Side Pull Force				0.25	Kg	90°, 4 directions, 5 s
Fiber Bend Radius		13			mm	
Lead Soldering Temperature				350	°C	10 sec
Laser Diode Forward Current	$I_{r\_max}$			1100	mA	CW
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	
Photodiode Reverse Voltage				20	V	
Photodiode Reverse Current				5	mA	
ESD Threshold				500	V	HBM, C = 100 pF, R = 1.5 kΩ

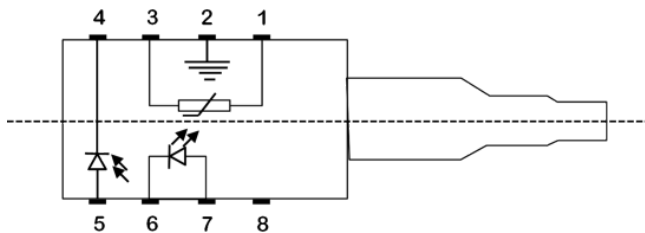
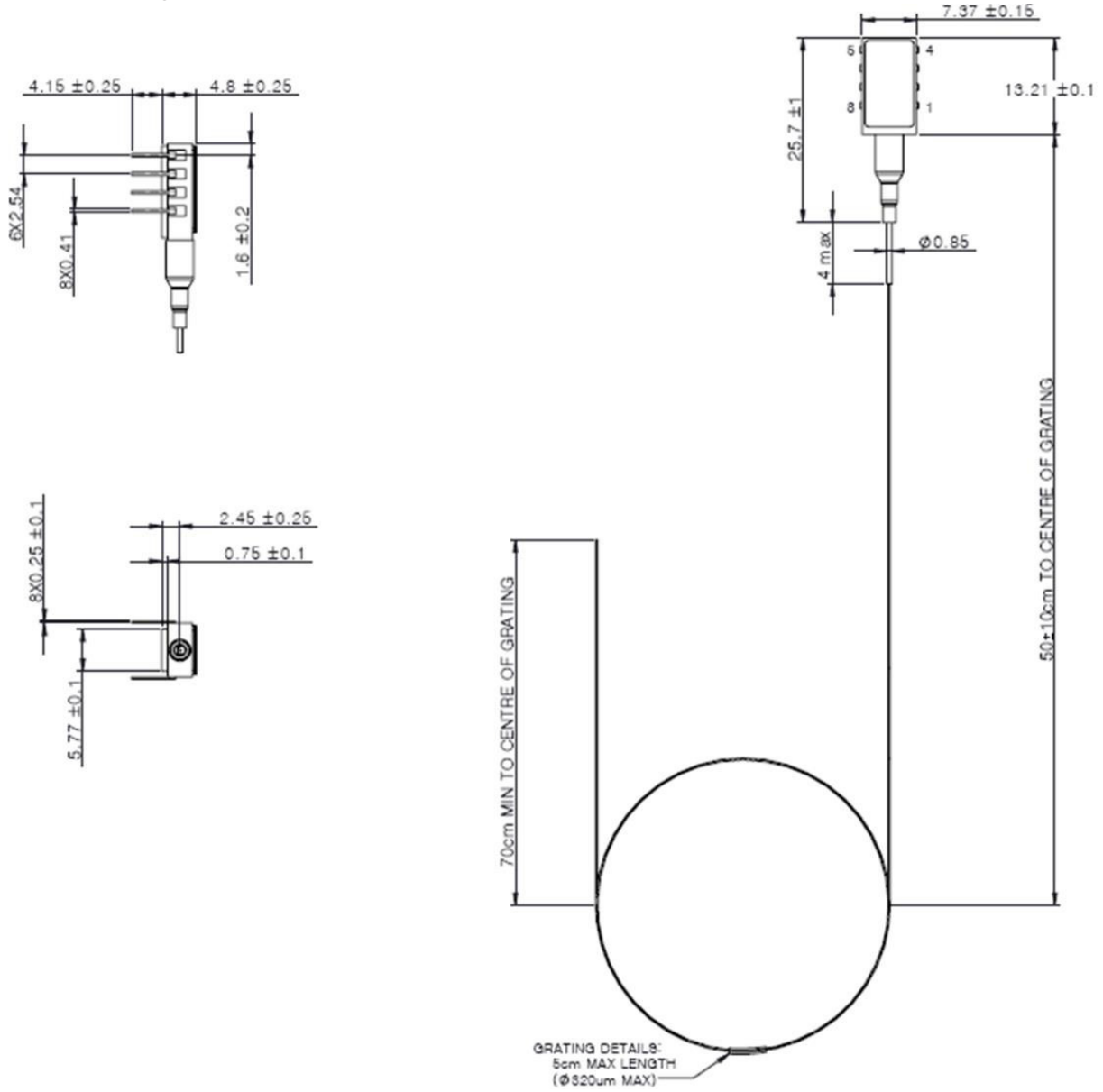
## Fiber Specification

Parameter	Min.	Typ.	Max.	Units	Condition
Fiber Type	PM980				
Cut-off Wavelength	870	920	970	nm	
Mode Field Diameter	6.1	6.6	7.1	μm	@ 980 nm
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	

1. Fiber termination; bare fiber with rough cleave.

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## Module Outline Drawing and Pin Connections



Pin	Connection
1	Thermistor
2	Package Ground
3	Thermistor
4	Monitor Pd Cathode
5	Monitor Pd Anode
6	Laser Diode Cathode
7	Laser Diode Anode
8	N/C

# UNCOOLED MINI-DIL 980 nm PUMP LASER MODULE

## Ordering Information

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

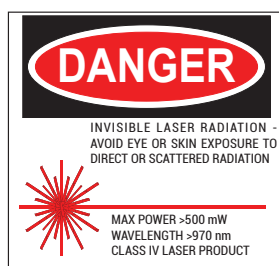
Example: LU96Z210-74 is a 210 mW Operating Power, 974 nm product.

## 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 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 Ed 3.0



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 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.