DCL96**74P-21R

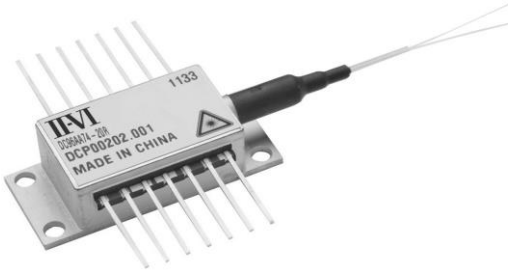
Cooled Dual Chip 14pin Butterfly 980nm Pump Laser Module

Features

- Two chips utilizing one carrier, one package and one TEC
- High output power, up to 600mW kink free
- Combined power of >1.0W with variable power ratios
- Combined total laser current up to 2200mA
- Minimal thermal or optical cross talks
- Two independent fibers
- Fiber Bragg grating stabilization for wavelength locking over the entire operating conditions
- Internal thermoelectric heatpump and monitor photodiode
- Hermetically sealed 14 pin butterfly package
- Telcordia GR-468-CORE compliant
- Field-proven high reliability
- RoHS compliant

Applications

- Low noise EDFAs
- Multi stage applications
- Mid-stage Access (MSA) EDFA
- Dense wavelength division multiplexing (DWDM) EDFAs
- Arrayed EDFA for ADD/DROP ROADM applications



Product Overview

The high power, cooled, dual chip, dual fiber, DCL96**series in a 14-pin BTF package is IIVI's first generation of dual chip pump modules. The DCL96* series provide high optical power yet low power consumption for highly reliable multistage pumping of SFF metro, cross-connect, multi-channel applications specifically arrayed EDFA for ADD/DROP ROADM application as well as 40/100Gb/s per-channel amplification.

The DCL96* series is designed to offer cost effective, power efficient and space saving solutions to EDFA designers. These laser modules are designed to integrate two pump laser diodes onto one 14-pin BTF package incorporating one thermoelectric (TEC) cooler and two fibers through single package feedthrough. The two laser diodes are dynamically and independently operated offering minimal optical and thermal cross talk.

The fibers are coupled and fixed using II-VI's field proven, high stability, high reliability 'OC2' alignment design and processes. The two laser diodes are wavelength stabilised to the desired wavelength using external Fiber Bragg Grating (FBG).

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Operating Parameter

Laser Power 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)
A	400	365	640	750
C	420	380	665	775
E	440	400	695	800
G	460	420	725	830
J	480	435	750	860
L	500	455	780	885
N	520	475	810	920
R	540	490	835	940
T	560	510	865	975
V	580	525	890	1000
X	600	545	920	1000

Notes;
1. Conditions unless otherwise stated: Case temperature -20 to 75°C, Submount temperature 40°C, Monitor diode bias -5V, CW operation
2. Operating power assumes a 10% ageing margin: Operating Power = Kink-Free Power/1.1
3. All parameters are per single chip unless specified otherwise

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Product Specification

Parameter		Min.	Typ.	Max.	Units	Condition
Threshold current	I_{th}		40	55	mA	
Maximum combined current				2200	mA	
Operating forward voltage	V_{op}		1.8	2.0	V	
Centre Wavelength		973	974	975	nm	
Spectral width	Δλ		0.2	1.0	nm	RMS at -13dB
Signal to noise ratio	SNR	20			dB	
Temperature dependence of peak wavelength	Δλ/ΔT		0.008	0.01	nm/°C	FBG temperature dependency
Monitor detector responsivity	R_m(LD1) R_m(LD2)		3 0.6	10 5	μA/mW	
Monitor dark current	I_{dark}			50	nA	-5V bias voltage
Fiber power stability >30mW 20 – 30mW 10 – 20mW 5 – 10mW	ΔPf_t			 0.15 0.10 0.20 0.35	dB	Peak-to-peak Time = 60sec DC to 50kHz
Return loss	RL	8			dB	1500nm – 1600nm
Thermistor BETA value	β	3539	3575	3611		±1% temperature variation
Thermistor resistance	R_{th}	9.5	10.0	10.5	kΩ	At submount temperature of 40°C
Heat pump current	I_{TEC}		1.7	1.9	A	Total IF= 2100mA
Heat pump voltage	V_{TEC}		2.0	2.4	V	
Optical power cross talk				0.5	mW	At any condition
Thermal cross talk				<1.0	°C	Ifmax=1100mA per chip

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Absolute Maximum Ratings

Parameter		Min.	Typ.	Max.	Units	Condition
Operating case temperature	T_{op}	-20		75	°C	
Storage temperature	T_{stg}	-40		85	°C	
Storage relative humidity	RH_{stg}	5		95	%	But not to exceed 0.024kg of water per 1.0kg of dry air
Operating relative humidity	RH_{op}	5		85	%	But not to exceed 0.024kg of water per 1.0kg of dry air
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			1200	mA	CW
Laser diode current transient				1400	mA	Time = 1000ns max.
Laser diode reverse current	I_r			10	µA	
Laser diode reverse voltage	V_r			2.0	V	
Heat pump current	I_{TEC}	-2.2		2.2	A	Thermistor and TEC must be in closed loop control at all times
Heat pump voltage	V_{TEC}	-3.0		3.0	V	

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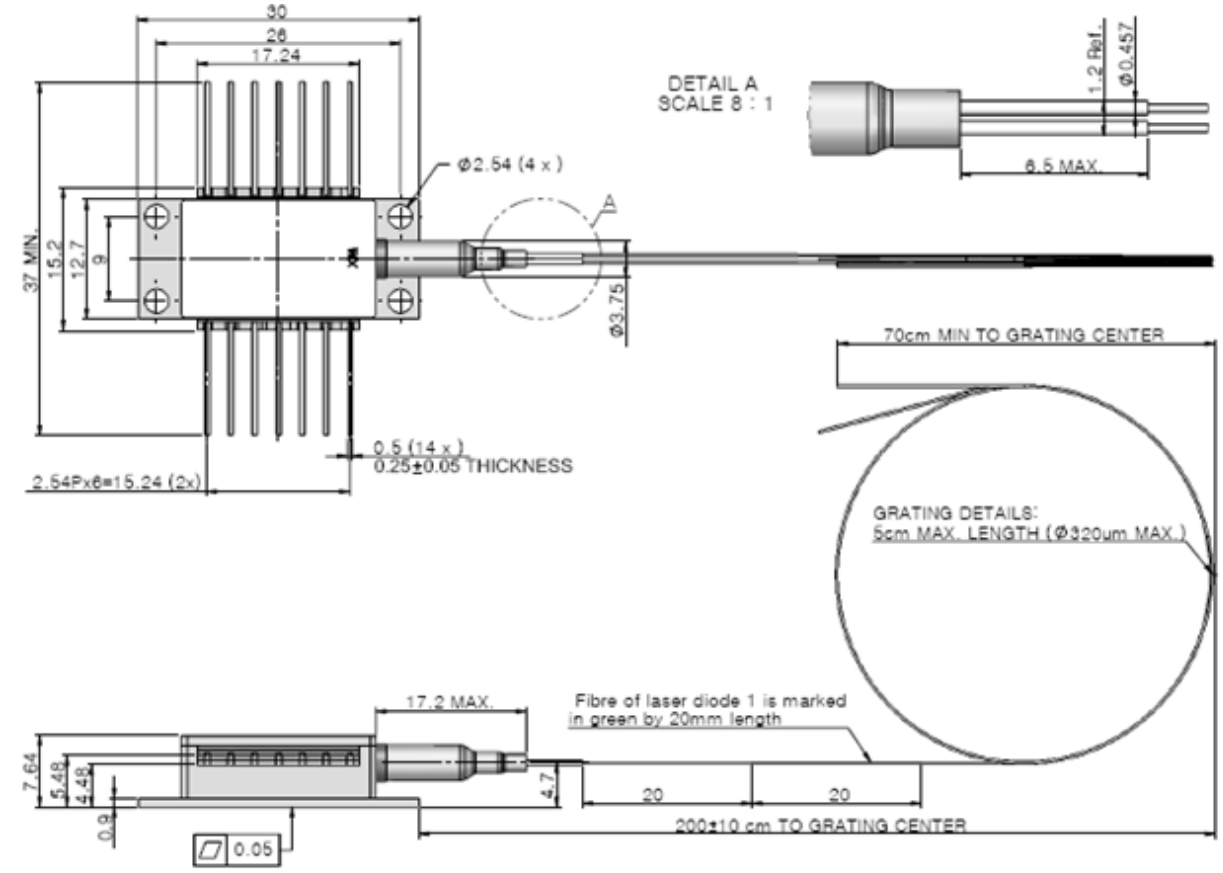
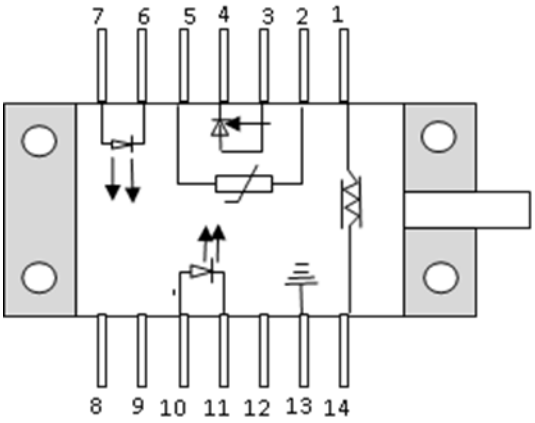
Module Outlines Drawing and Pin Connections





Pin	Description	Pin	Description
1	TEC (+)	8	Not connected
2	Thermistor	9	Not connected
3	Monitor anode (-)	10	LD1 Anode (+)
4	Monitor cathode (+)	11	LD2 Cathode (-)
5	Thermistor	12	Not connected
6	LD2 Cathode (-)	13	Case ground
7	LD2 Anode (+)	14	TEC (-)

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Fiber Specification

Parameter		Min.	Typ.	Max.	Units	Condition
Fiber type	Nufern PM980-XP or Corning PM 98-U25					
Cut-off wavelength		830	900	970	nm	
Mode field diameter		5.6	6.6	7.6	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	

Note; Fiber termination; bare fiber with rough cleave.

Ordering Information

DCL	96	*	*	74	P	-21	R
Product Type	Chip Type	LD1 KFP	LD2 KFP	Wavelength 74 for 974nm	Product Design	Package type	RoHS Compliance

Example: DCL96AL74P-21R is a 400mW KFP for LD1 and 500mW KFP, 974nm product.

Contact Information

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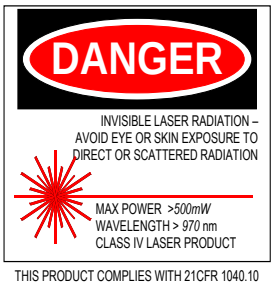
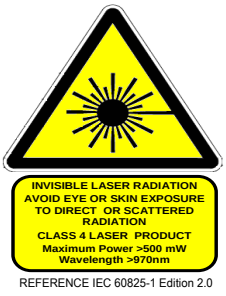
RoHs Compliance

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.





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.

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