JDS Uniphase

Product Bulletin

4000 Series Pumps
High power, high reliability multimode pump modules

JDS Uniphase pump modules are fast becoming the standard for high power with high reliability in Erbium doped fiber amplifiers used for telecommunications applications. In order to address the growing market for pumping Ytterbium doped double-clad fiber lasers, JDS Uniphase has introduced the 4000 Series of high power 915 nm and 970 nm high reliability pump modules. These high power multimode pumps are qualified under the same rigorous Telcordia™ guidelines as our single-mode pumps.

Cladding pumped fiber laser coupling allows the use of multimode diode lasers which can reach higher powers than currently attainable in single mode diode lasers. The multimode laser diode used in this module has been characterized for reliable operation through the use of accelerated multi-cell lifetesting. The 4000 Series features 750 mW at .22 NA and .15 NA from a 100 µm multimode fiber.

Key Features
- Highly reliable 750 mW from a 100 µm fiber
- 915 and 970 nm wavelengths
- .22 and .15 NA fiber output
- Demonstrated reliability through telecom qualification and life testing

Applications
- Ideal for pumping double-clad Ytterbium doped fiber lasers used in Raman amplification
- Ideal for pumping double-clad fiber amplifiers

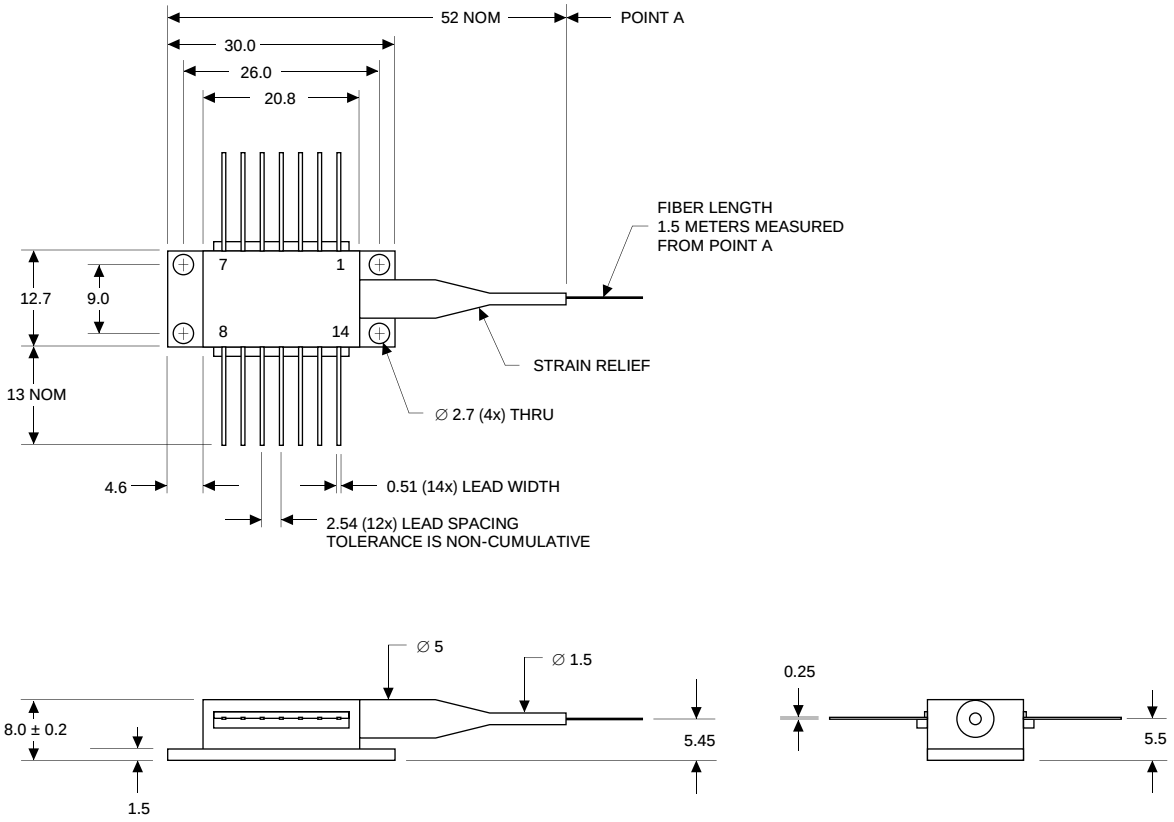
Multimode Pump Performance Specifications

			SDLO-4000		SDLO-4210		
Parameter	**Symbol**	**Test Condition**	**Min**	**Max**	**Min**	**Max**	**Units**
Absolute Maximum Ratings (short excursions only)							
Optical Power (fiber)	P_f	CW	-	1200	-	1200	mW
Operating Current	I_{op}	CW	-	2000	-	2000	mA
Laser Diode Reverse Voltage	V_{revLD}	-	-	2.0	-	2.0	V
Operating Characteristics (T_c= –20 to 65°C, T_s = 25°C unless otherwise specified)							
Optical Power	P_{out}	25°C, I_{op}	750	-	750	-	mW
Center Wavelength	λ_c	25°C, I_{op}	910	925	965	975	nm
Threshold	I_{th}	25°C	-	350	-	350	mA
Operating Current	I_{op}	25°C	-	1500	-	1500	mA
Laser Diode Forward Voltage	V_{fwdLD}	25°C	-	1.8	-	1.8	V
Operating Case Temperature	T_c	-	-20	65	-20	65	°C
Storage Temperature	T_{stg}	-	-40	80	-40	80	°C
Thermal Characteristics (T_c= –20 to 65°C, T_s = 25°C unless otherwise specified)							
Thermistor Resistance	R_{therm}	T_s = 25°C	9.5	10.5	9.5	10.5	kΩ
Cooling Capacity	ΔT	T_c=65°C, T_s=25°C, I_{op}	40	-	40	-	°C
Maximum TEC Voltage	V_{TEC}	T_s=25°C, I_{op}	-	2.7	-	2.7	V
Maximum TEC Current	I_{TEC}	T_s=25°C, I_{op}	-	2.0	-	2.0	A
Maximum Power Dissipation (total internal + TEC P_h)	Ph	T_c=65°C, T_s=25°C, I_{op}	-	7.5	-	7.5	W

Parameter	**Specification**	**Specification**	**Units**
Fiber Pigtail Specifications (T_c= –20 to 65°C, T_s = 25°C unless otherwise specified)			
Fiber Core Diameter	104 ±3	105 ±3	µm
Fiber Cladding Diameter	125 ±2	125 ±2	µm
Buffer Diameter	250 ±15	250 ±15	µm
Fiber NA	.22 ±.02	.15 ±.015	
Fiber Length	1.5 ±.25	1.5 ±.25	m

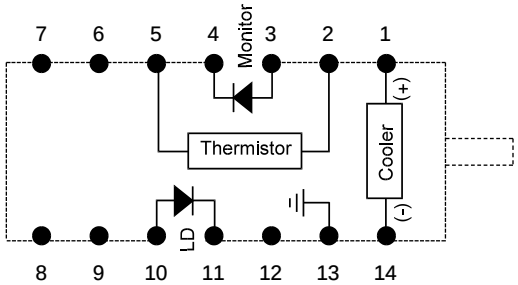
Package Dimensions

Dimensions in millimeters except where indicated



Lead Connection

Electrical Schematic
(Package Viewed From Top)



Lead Connections

1	Cooler (+)
2	Thermistor
3	Monitor PD Anode
4	Monitor PD Cathode
5	Thermistor
6	N/C
7	N/C
8	N/C
9	N/C
10	Laser Anode
11	Laser Cathode
12	N/C
13	Case Ground
14	Cooler (–)

User Safety

Safety and Operating Considerations

The laser light emitted from this laser diode is invisible and may be harmful to the human eye. Avoid looking directly into the fiber when the device is in operation.

CAUTION: THE USE OF OPTICAL INSTRUMENTS WITH THIS PRODUCT WILL INCREASE EYE HAZARD.

Operating the laser diode outside of its maximum ratings may cause device failure or a safety hazard. Power supplies used with the component must be employed such that the maximum peak optical power cannot be exceeded.

CW laser diodes may be damaged by excessive drive current or switching transients. When using power supplies, the laser diode should be connected with the main power on and the output voltage at zero. The current should be increased slowly while monitoring the laser diode output power and the drive current.

Careful attention to heatsinking and proper mounting of this device is required to insure specified performance over its operating life. To maximize thermal transfer to the heatsink, the heatsink mounting surface must be flat to within .001" and the mounting screws must be torqued down to 1.5 in.-lb.

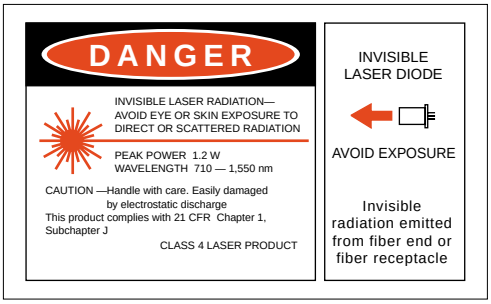
ESD PROTECTION — Electro-static discharge is the primary cause of unexpected laser diode failure. Take extreme precaution to prevent ESD. Use wrist straps, grounded work surfaces, and rigorous anti-static techniques when handling laser diodes.

21 CFR 1040.10 Compliance

Because of the small size of these devices, each of the labels shown is attached to the individual shipping container. They are illustrated here to comply with 21 CFR 1040.10 as applicable under the radiations control for health and safety act of 1968.

SERIAL NUMBER IDENTIFICATION LABEL

OUTPUT POWER AND LASER EMISSION INDICATOR LABEL



Ordering information

For more information on this or other products and their availability, please contact your local JDS Uniphase sales representative or JDS Uniphase directly at 408 943-4200, or by fax 408 943-4252, or via email at sales.ca@us.jdsuniphase.com. Visit our Web site at www.jdsuniphase.com.

JDS Uniphase

JDS Uniphase Corporation
80 Rose Orchard Way
San Jose, California
95134 USA

Tel 408 943-4200
Fax 408 954-4252
sales.ca@us.jdsuniphase.com
www.jdsuniphase.com

4000 Rev. A 03/01 Printed in USA