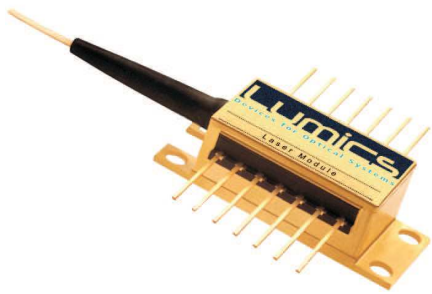


Single Mode Laser Module

14-pin Package up to 500mW c.w. @ 760nm - 1550nm
custom wavelengths on request



Description:

The Lumics single mode laser module contains an optimized GaAs substrate based quantum well high power laser diode. It has been designed for customer specific applications and is available with special FBG's and fibers. The extremely stringent reliability requirements are achieved through our patent pending innovative technology. This includes careful design, exactly defined manufacturing and extensive testing. The qualification contains a set of optoelectronic, thermal and mechanical tests. Each laser diode module is individually serialized for traceability and is shipped with a specified set of test data.

Features & Functions:

- Single mode pigtail
- Cooled 14pin package
- Telcordia compliant package
- RoHS compliant

Options:

- FBG-options
- Low rise <1 ns
- Narrow and ultranarrow linewidth
- Connector incl. 900µm protection tube

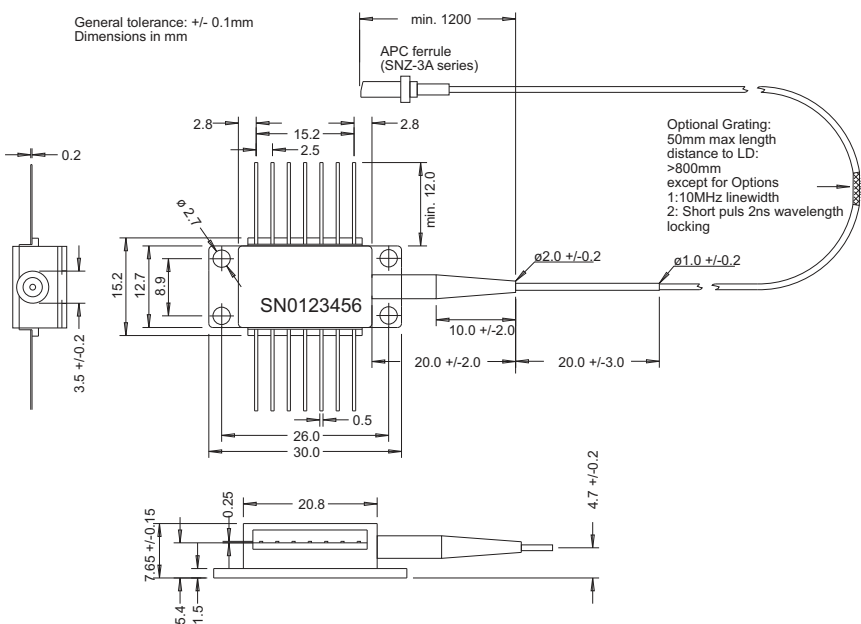
Benefits:

- All laser welded
- Field proven reliability
- Hermetic sealing

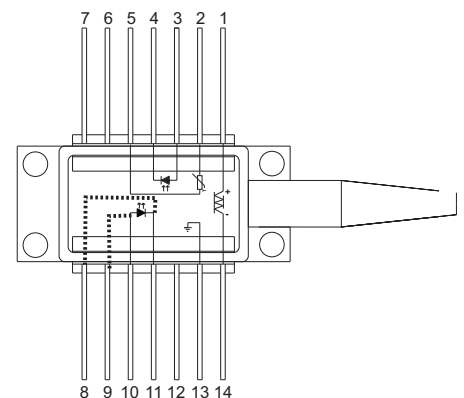
Applications:

- Sensor applications
- Analytical instruments
- Pumping and seeding
- Printing

Module Drawing (Dimensions in mm)



Pin Connections



Pin	Function	Pin	Function
1	Cooler (+)	8	(*) LD Cathode (-)
2	Thermistor	9	(*) LD Anode (+)
3	PD Anode (+)	10	LD Anode (+)
4	PD Cathode (-)	11	LD Cathode (-)
5	Thermistor	12	nc
6	nc	13	Case ground
7	nc	14	Cooler (-)

(*) Optional low inductive

We manufacture diode lasers.

Typical laser specifications at 25°C (*)

Wavelength at Pop [nm]	max. Power, c.w. [mW] (1)	Peak Pulse Power[mW]
760	200	400
786	250	550
808	250	550
845	200	550
910	300	1000
975	500	1200
1030	300	1000
1064	450	1200
1080	300	1000
1100	300	600
1550	150	200

Parameter	Symbol / Conditions	Min	Typ	Max	Unit
Rise and fall time (2)			2		nsec
Spectral width (FWHM) (3)	D I / at P _{op} , without FBG	0.05	multiple peaks, 0.1	<2	nm
Spectral width (FWHM) (4)	D I / at P _{op} , with FBG only	0.05	0.08	0.5	nm
Spectral width 1550nm only (FWHM) (3)	D I / at P _{op} , without FBG		6		nm
Spectral width 1550nm only (FWHM) (4)	D I / at P _{op} , with FBG only		0.8		nm
Optical power stability	P _{op} / t / at I _{op} , t = 60 sec			0.5	%
Side mode suppression (3)	at P _{op} , with FBG		20		dB
Monitor responsivity (not for 1550nm)	R	0.1	0.2	20	µA/mW
Monitor dark current (not for 1550nm)			5	40	nA
TEC current	I _{TEC} / chip 25°C, case 70°C		1.1		A
TEC voltage	V _{TEC} / chip 25°C, case 70°C		1.9		V
Thermistor resistance	R _{th} / T=25°C	9.5	10	10.5	kOhm
Thermistor B constant	B	3850	3950	4050	K
Steinhart-Hart-Equation coefficients		C1= 1.1292E-03 / C2= 2.3411E-04 / C3= 8.7755E-08			
Large signal modulation bandwidth			200		MHz

Fiber Specifications

Fiber type	single mode non PM fiber
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Notes:

- (*) Wavelength is measured in air. The spectral measurement is always done at operating power and outgoing inspection checks spectral properties at that power value only with the fiber pigtail fully coiled with a radius of about 50mm .
- Ensure sufficient protection against high energy back reflection pulses from solid state lasers. High energy back reflection damages the diode (for example stimulated Brillouin scattering). Typical damage threshold for 8ns puls @200KHz is 0.05µJ (this level is not covered under warranty).
 - Rise and fall times depend on appropriate driver and can be lower than 1ns with the low inductive version.
 - Without wavelength stabilisation by a fiber bragg grating(FBG) multiple peaks (side modes) around the average wavelength for a specific current in a range of (1-3) nm are observed. The full width have maximum (FWHM) of those peaks can suddenly narrow or broaden. Side mode suppression counts the first side peaks next to the main peak. A peak is defined by significant lower values left and right to this peak.
 - With wavelength stabilisation by a fiber bragg grating (FBG) a single peak for a specific current is observed. The spectral stability depends on the fiber mechanical stress to the fiber which may change polarization state and peak reflection value of the FBG matching the polarization state of the diode laser. Thus it may be necessary to fix the fiber mechanically to achieve good spectral stability. In order to compensate for a non-locking spectral difference larger than +-5nm between diode laser peak wavelength and FBG peak reflection due to the shift (about 5nm/A) of the diode laser peak wavelength with current the customer may tune the internal temperature and peak wavelength (0.3nm/°C) of the diode laser to improve wavelength locking and spectral stability. The full width half maximum (FWHM) of this single peaks is stable over time as long as it is not disturbed by further back reflection from the outgoing optical path.
 - Intensity noise of light from modules with PM fiber after polarizer increases with lower polarization extinction ratio (example 6 /10/13 dB can result in intensity noise as high as 50/20/5 %). The intensity noise is sensitive to varying stress (by mechanical and temperature effects) introduced to the PM fiber.

General Parameters / Accessories

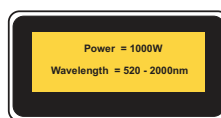
Parameter	Symbol	Min	Typ	Max	Unit
Storage temp.	Tmax	-40		85	°C
Operating case temp.	Top, case	-20		70	°C
Operating chip temp.	Top, chip	20		40	°C
Soldering temp. (max. 10sec)		260			°C
LD reverse voltage	VR, max			2	V
Monitor forward current	IF, PD			5	mA
Monitor reverse voltage	VR, PD			20	V
TEC current	ITEC			2.5	A
TEC voltage	VTEC			3.2	V
ESD damage (1)		500		V	
Fiber pigtail bend radius		25			mm

(1) A standard human body model (1.5kOhm, 1000pF) is used for ESD thresholds

Note:

Absolute maximum rating for the laser diode operating current in cw mode may be applied for short period of time only (<10s). Exposure to maximum ratings for extended period of time or exposure above one or more max ratings may cause damage or affect the reliability of the device.

User Safety



Important Note Read and carefully follow operating manual instructions. Especially, whenever power supply is switched on or off, always disconnect from laser module. See manual for details. Uncontrolled on / off switching may cause spikes and result in fatal device damage. This product is not certified by with IEC 60825-1 or 21CFR1040.10/ 21CFR1040.11 and must comply with the applicable regulations by the Purchaser if sold as laser product.

We manufacture diode lasers.