



LuOcean P2 Diode Laser @ 1940 nm up to 22 W



Description:

The Lumics LuOcean P2 diode laser series offers OEM integrators an excellent product to manufacture state-of-the-art end-user laser systems.

The easy integration and safe use of these laser components in combination with several accessories and features give the chance to be cost-efficient in development and manufacturing.

Features & Functions:

- Up to four wavelengths
- 400 μm NA 0.22 fiber
- Emitter electrically in series
- Temperature sensor
- Controllable pilot intensity

Options:

- Exchangeable window
- Red or green pilot
- Fiber & Power monitor
- OEM LD driver & cooler
- Controllable pilot intensity

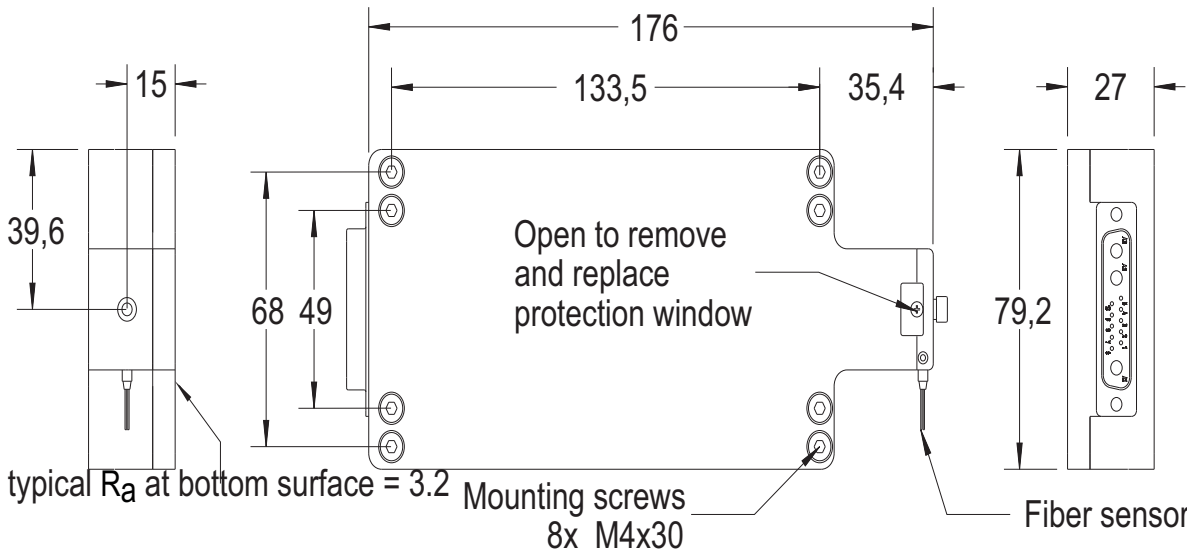
Benefits:

- Single emitter long lifetime
- Passive cooling
- Sealed housing
- Small foot print
- SMA connector

Applications:

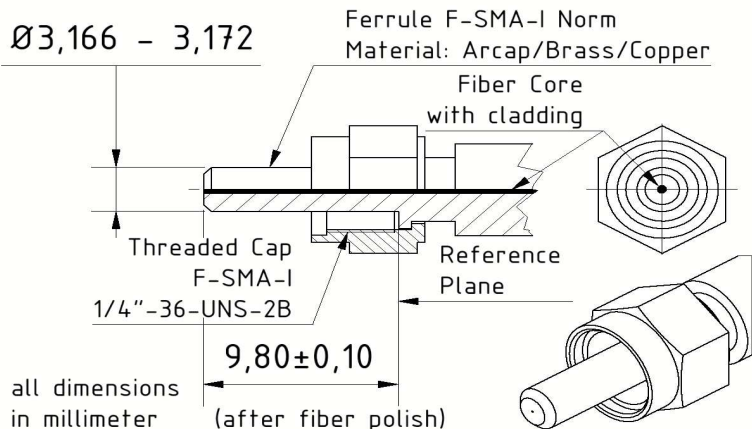
- Therapeutic
- Dental
- Dermatology
- Veterinary
- Pumping

Module Drawing (Dimensions in mm)

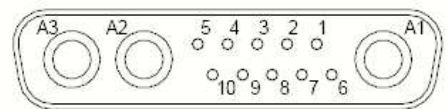


Fiber Connector

- (1) Lumics laser diode fiber coupling technology ensures loss into the fiber cladding of <math><10\%</math> (7/8/9/10/14xxnm for fiber core $\leq 105\mu\text{m}$), <math><3\%</math> (7/8/9/10/14xxnm for fiber core $\geq 200\mu\text{m}$) and <math><20(10)\%</math> (19xxnm for fiber core $\geq 200(400)\mu\text{m}$) of the total power if the fiber centricity (typically $\leq 10\mu\text{m}$), ferrule diameter and distance of the fiber end facet to the reference plane complies with shown technical drawing and the Lumics fiber data sheet. Use a fiber microscope to check for dust free fiber end facet and fiber centricity.
- (2) Free standing fibers suffer from higher risk of fiber damage to the fiber tip due to mechanical stress by handling and the fiber end facet can not be polished as simple as for not free standing fibers.
- (3) For more information see the Lumics fiber data sheet http://www.lumics.de/wp-content/uploads/lu_fiber_patchcords.pdf



13w3 Male Power and Signal Connector



Pin Configuration

Pin	Configuration
1	Plot power control (0-5)V *
2	n.c.
3	Monitor diode cathode
4	LM35 (GND1), Monitor diode (GND1)
5	LM35 signal *
6	n.c.
7	Monitor diode signal 1 *
8	Pilot laser (GND2)
9	LM35 5V
10	Pilot laser 8 V (green) *
A1	Laser diode (+)
A2	Laser diode cathode (-)
A3	n.c.

* Optional, n.c. = no connection

We manufacture diode lasers.

Typical laser specifications at 25°C (*)

Parameter	Conditions	Min	Typical	Max	Unit
Optical Characteristics					
Maximum output power (1)	P _{op} (c.w.) 400µm	22			W
Peak wavelength (at P _{op})	I _{peak} (c.w.)		1940 ± 20		nm
Spectral width (FWHM)	I _{FWHM}	10	14	18	nm
Spectral shift with temperature	I _{T_shift}		1		nm / K
Spectral shift with current	I _{I_shift}		3		nm / A
Electrical Characteristics					
Forward current / voltage	I _{op} / V _{op} (c.w)			11 / 14	A / V
Threshold current	I _{th}		0.5		A
Conversion efficiency	eta _{eff}		18		%
Other General Features					
Fiber core diameter			400		µm
Fiber centricity			≤10		µm
Numerical Aperture	NA		0.22		
Fiber connector type			SMA905		
Pilot Beam (Options) (note 5.6.7)					
Pilot Beam Output Power	red/green - adjustable	0		3	mW
Pilot Beam Wavelength	red/green		650±10 / 520±10		nm
Pilot Beam Operating Voltage	red/green	4/7		5/8	V
Pilot Beam Operating Current	red/green			35/125	mA
Pilot Beam Intensity Control Voltage	red/green	0(max. Intensity)		5(min. Intensity)	V
Sensors (Options)					
Power Monitor Supply Voltage		10	12	14	V
Power Monitor Signal Voltage		0		1	V
Fiber Detection Sensor (as electrical switch) Supply Voltage		10	12	14	V
Fiber Detection Sensor (as electrical switch) Signal Voltage		0	12	14	V
A second fiber sensor is an external inductive sensor with three wire cable (V _{cc} =12V, GND, Signal 12/2V when fiber is plug/not plugged)					
Temperature Sensor			Standard NTC (10k) or optional (PT100 or LM35)		
Water cooling base plate (Option)					
Water flux (industrial water no DI water)	at 18°C		1.5		l/min

Notes: * taken at internal temperature sensor

(1) Power is measured ex fiber according to given fiber specifications including measures and tolerances of fiber and ferrules for uncoated fiber facets.

Minimum repeatable power with internal temperature and current accuracy of +0% is ≤±3% of maximum power. Please add tolerance of your temperature and current control.

(2) Do not exceed maximum forward current for rated power as given above by more than 5% otherwise the laser diode may be damaged

(3) Rule of thumb: Power ex fiber decreases by app. 5% (<1100nm), 7% (>1400nm) and 12% (>1900nm) every 10 °C temperature increase at internal temperature sensor. Lifetime decreases by about factor of two every 10 °C. Required flatness of customer heat sink 0.05mm over entire bottom surface to achieve necessary contact to the heat sink.

(4) Red and green minimum pilot power is set at factory by customer request. Standard is 3 mW.

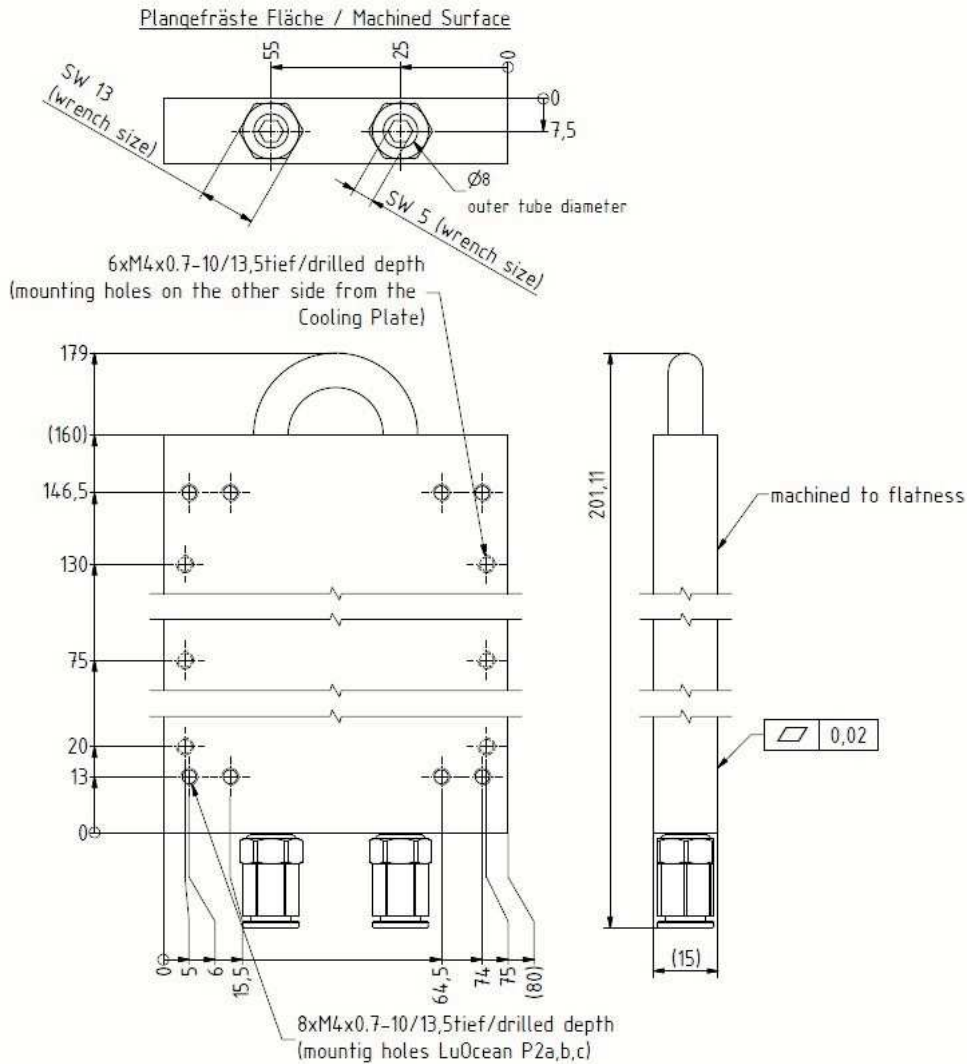
(5) Calculation of the thermal load and necessary thermal resistance of a heat sink to maintain internal diode temperature of 25°C :

Thermal load = Output power * (1/conversion efficiency - 1)

Heat sink thermal resistance = (25 °C - ambient temperature) / thermal load

Option: P2 water cooling base plate with quick release water connectors and thermal resistance of 0.03 K/W.

Please note : Avoid to remove the water cooling plate from the P2 laser module because the optics is aligned with the water cooling plate attached to the P2 module. If it is removed the housing might relax mechanically which move the fiber coupling port/nose away from the focused light spot. Never change to a water cooling with a lower specifications regarding flatness because this will bend the module and therefore lower fiber coupling efficiency.



General Parameters / Accessories

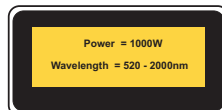
Parameter	Symbol	Min	Typ	Max	Unit
Storage Temperature	TS	-10		55	°C
Internal operating * and (Ambient) temp , c.w.-operation **	Top c.w.	10(5)		35(40)	°C
Humidity / Non-condensing Atmosphere				90	%
Thermal heat sink resistance				0.1	k/W
Maximum fiber flange temperature				50	°C
Weight			1200		g
Compliance			CE, ROHS		

Further Options (Please ask for quotation if needed)

Optical fiber patchcord, Laser diode drivers for each individual wavelength, Interface cable , OEM laser diode driver and temperature controller

* taken at internal temperature sensor ** we recommend to operate the laser above dew point. Below dew point water condensation on the exit window may damage the window when laser is switched on. If the module was stored below dew point before operation dry the window by pre-heating the module to 25°C

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 and must comply with the applicable regulations by the Purchaser if sold as laser product.

We manufacture diode lasers.