

LuOcean P2

LU09xx/1470C Diode Laser
Mixed Wavelength up to 115 W @ 9xxnm and 35 W @ 1470 nm



Description:

The 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 give the chance to be cost-efficient in development and manufacturing. Equipped with several accessories and features the Lumics diode lasers comply with CE & ROHS requirements. Lumics warranties highest reliability single emitter technology through careful design, extensive burn-in, long life-time & thermal testing.

Features & Functions:

- Wavelength 9xx/1470 nm
- Burn-in tested single emitters
- Fiber: 200/400 μm
- SMA905
- Sealed housing
- Temperature sensor

Options:

- Power monitor
- Fiber sensor
- Red or green pilot laser
- Water cooling plate

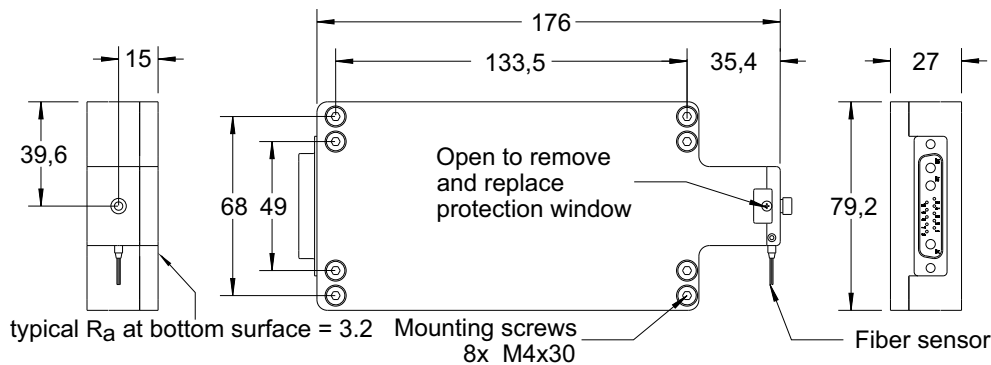
Benefits:

- Small foot print
- Ultra long lifetime
- Cost effective
- High efficiency
- Protective exit window option

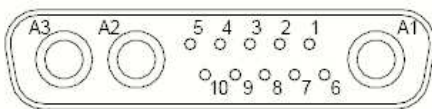
Applications:

- Medical treatment

Module Drawing (Dimensions in mm)



13w3 male Power and Signal Connector

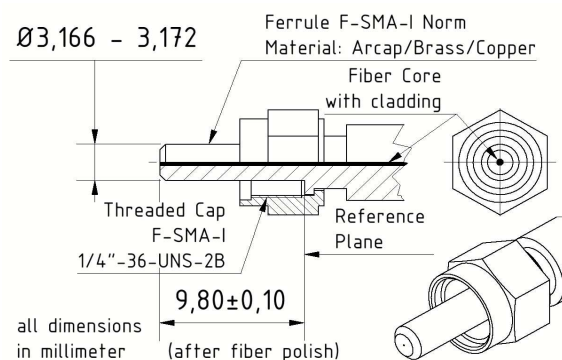


Pin	Configuration
1	9xxnm LM35 signal or NTC or PT100/1000 or pilot laser control *
2	9xxnm LM35 (5V) or NTC or PT100/1000 or pilot laser control *
3	Monitor diode cathode (5-12)V *
4	LM35 (GND1) Monitor diode (GND1)
5	1470nm LM35 signal or NTC or PT100/1000
6	Monitor diode signal 2 *
7	Monitor diode signal 1 *
8	Pilot laser (GND2)
9	1470nm LM35 5V or NTC or PT100/1000
10	Pilot laser 8 V(green) or 5 V(red) *
A1	1470nm laser diode (+)
A2	Laser diode common cathode (-)
A3	9xxnm laser diode (+)

* Optional

Fiber Connector

- (1) Lumics laser diode fiber coupling technology ensures loss into the fiber cladding of <2% of the total power if the fiber centricity is below 10μm and ferrule diameter and distance of the fiber end facet to the reference plane complies with shown technical drawing. 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 http://www.lumics.de/wp-content/uploads/lu_fiber_patchcords.pdf



We manufacture diode lasers.

Electrical and Optical Characteristics (Typical laser specifications at 25° C *)

Parameter	Conditions	9xxnm & 1470nm in 200µm	@9xxnm & 1470nm in 400µm	Unit
9xx nm & 1470 nm				
Maximum output power (1)	P _{op} 9xxnm (c.w.)	75	110	W
	P _{op} 1470nm (c.w.)	25	35	W
Peak wavelength (at I _{op})	λ _{peak} @ 9xxnm	9xx ± 10	9xx ± 10	nm
	λ _{peak} @ 1470nm	1470 ± 20	1470 ± 20	nm
Forward current / voltage (2)	I _{op} / V _{op} @ 9xxnm	16 / 12	24 / 11	A / V
	I _{op} / V _{op} @ 1470nm	12 / 10	21 / 9	A / V
Threshold current	I _{th} @ 9xxnm	1	2.2	A
	I _{th} @ 1470nm	1.1	1.9	A
Fiber core diameter		200	400	µm
Other General Features				
Conversion efficiency	@ 9xxnm	45	47	%
	@ 1470nm	20	20	%
Spectral shift with temp.	λ _{T Shift} 9xxnm	0.3	0.3	nm / K
Spectral shift with temp.	λ _{T Shift} 1470nm	0.7	0.7	nm / K
Fiber centricity		<10	<10	µm
Numerical Aperture	NA	0.22	0.22	
Fiber connector type		SMA905	SMA905	
Temperature sensor		LM35, NTC (10k) or PT100/1000 (please specify)		
Weight	m	1200	1200	g
Thermal resistance (from bottom to intern. temp. sensor) R _{th}		0.04	0.04	K/W
Options				
Option 1: Red Pilot laser				
C.w. output power min. value (2)	P _{pilot}	1-3	1-3	mW
Peak wavelength	λ _{pilot}	635 ± 10	635 ± 10	nm
Operating voltage		5	5	V
Current consumption		100	100	mA
Option 2: Green pilot laser				
C.w. output power min. value (4)	P _{pilot}	1-2	1-2	mW
Peak wavelength	λ _{pilot}	520 ± 10	520 ± 10	nm
Operating voltage		8	8	V
Pilot power control	P _{pilot_contr}	0-5	0-5	V
Option 3: water cooling base plate				
Water temperature	T	<18	<15	°C
Minimum water flux (industrial water, no DI-water)		1.5	2.0	l/min / (100) W
Option 4: Fiber sensor				
Internal (resistive) fiber detection sensor signal voltage		12	12	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)				

Notes: * taken at internal temperature sensor. Avoid direct feedback from materials like mirrors, optics, processed material etc. back into laser module via the fiber cable by more than 10%.

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

(2) Do not exceed maximum forward current by more than 5% above given operating current and if given by the maximum current otherwise the laser diode may be damaged.

(3) Rule of thumb: Power ex fiber decreases up to 5% (<1100nm) and up to 7% (>1400nm) 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 70mm to achieve necessary contact to the heat sink.

(4) Red and green minimum pilot power is set at factory by customer request. Standard is 1 mW.

Calculation example of necessary water temperature for 10 W output power:

Thermal load = Output power * (1/conversion efficiency - 1), Water temperature = internal temperature - thermal load * Thermal resistance

Example: Output power: 10 W, Conversion efficiency: 0.2, Thermal resistance: 0.1 K/W, Internal temperature: 25 °C

Thermal load = 10 W * (1/0.2 - 1) = 40 W, Water temperature = 25 °C - 40 W * 0.1 K/W = 21 °C, (water flux must be adjusted accordingly)

Absolute Maximum Ratings / General Informations

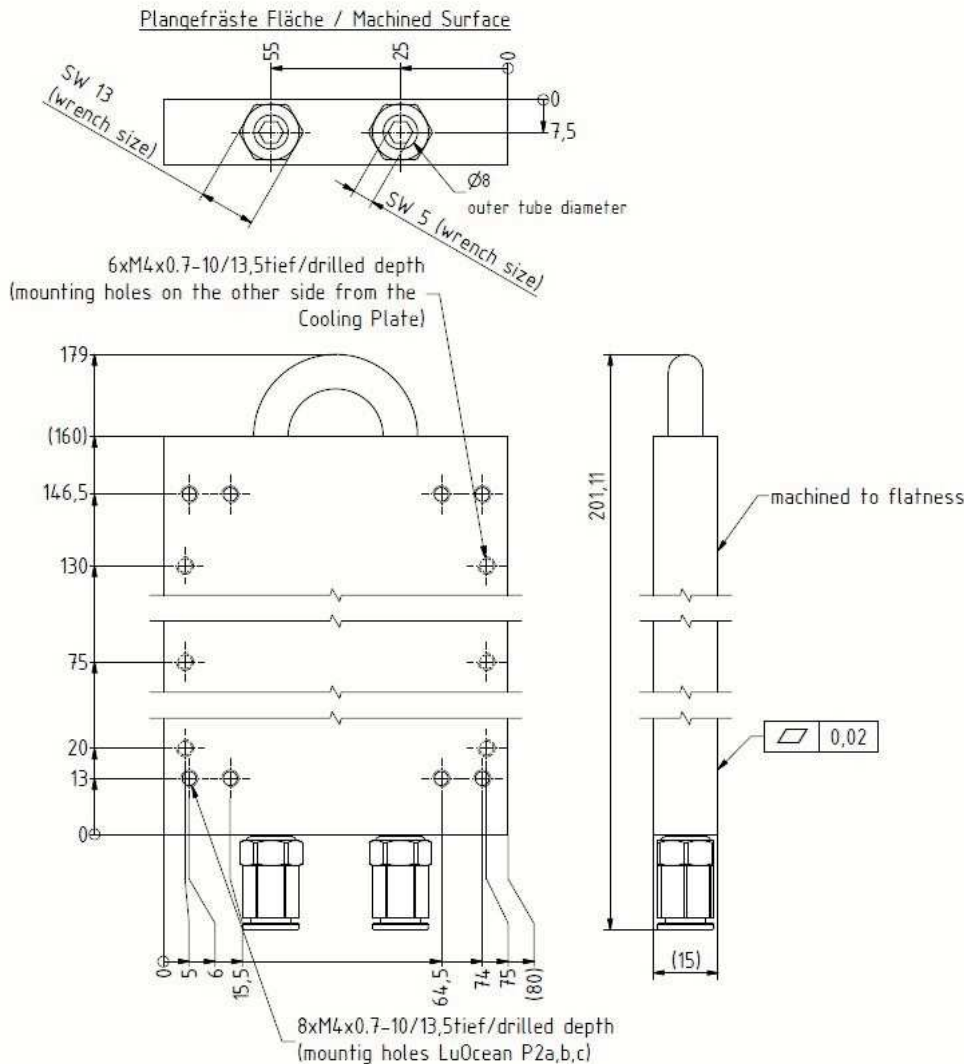
Parameter	Symbol	Min	Max	Unit
Storage temperature	T_{max}	0	+50	°C
Operating temp.* c.w.-operation **	$T_{op.c.w.}$	+15	+35	°C
Humidity / non condensing atmosphere			90	%
Recommended thermal heatsink resistance R_{th}			0.03	K/W
Max fiber flange temperature			45	°C
Max. back reflection of intrinsic pump wavelength output power			10	%
Max. back reflection any other than λ of this diode laser			10	μ J
Compliance		CE, ROHS		
Standard Accessories				
Interface connector		13w3 Female		
Mounting screws / metric		8 x M4 x 12		
Remarks				

* taken at internal temperature sensor

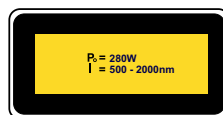
** we recommend to operate the laser above dew point

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



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.