LuOcean Mini 4

Diode Laser @ 785 nm - 1940 nm up to 70 W

Description:

The Lumics LuOcean Mini 4 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.

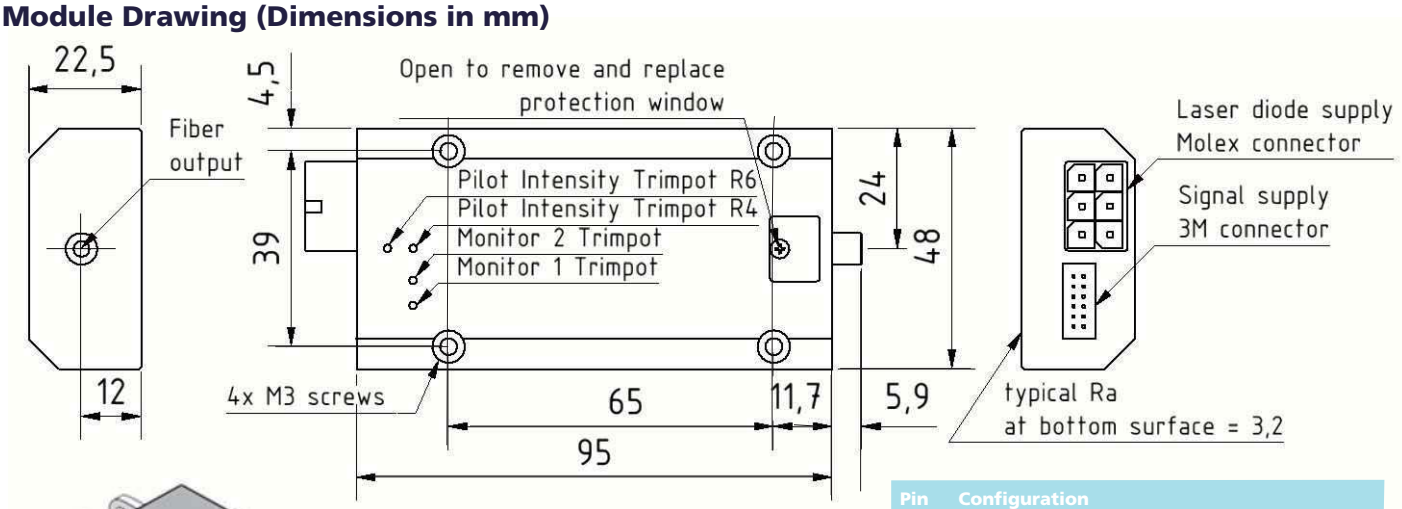
Features & Functions:
- Up to four wavelengths
- (105/200/400) µm NA 0.22 fiber
- Emitter electrically in series
- Temperature sensor

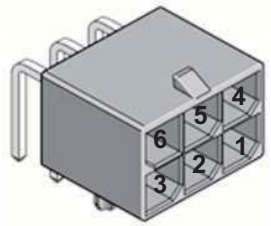
Options:
- Exchangeable window
- Red or green pilot
- Fiber & Power monitor
- OEM LD driver & cooler
- Controllable pilot intensity

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)



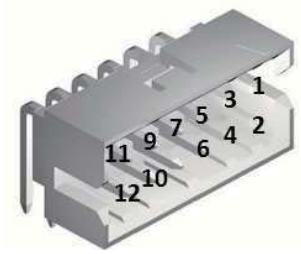


Connector - laser diode supply

Molex™ connector (Part No. 172064-0006).
Pin connection dependant on individual electro-optical configuration. Maximum current per pin is 26 A
if total current to cathode exceeds 26 A two pins must be connected to cathode of driver board

Counterparts for external cable
Molex Mega-Fit Receptacle Housing Part No. 171692-0106
Molex Mega-Fit Female Crimp Terminal
Part No. 76823-0322

Pin	Configuration
1	Laser diode common cathode (-)
2	wavelength x (+ or -) depending on configuration
3	wavelength x (+ or -) depending on configuration
4	wavelength x (+ or -) depending on configuration
5	wavelength x (+ or -) depending on configuration
6	wavelength x (+ or -) depending on configuration



Connector - signals

Connector on laser module Part No.
(Mini revision 3 3M 159112-5012)
(Mini revision 4 with locking Molex 87833-1273)

Counterpart for external cable
Molex Milli Grid Cable to Board Receptacle
Part No. 87568-1273 with locking ramp.
Flat ribbon cable with pitch of 1mm and AWG28

Pin	Configuration
1	Supply +12V
2	Fiber Sensor 1 Out (0-12V) (*)
3	GND1
4	Fiber Sensor 2 Out (0-12V) (*)
5	Monitor Photo Diode 1 Out (0-4(**))V (*)
6	Pilot Supply (5 V red, 8 V green) (*)
7	Monitor Photo Diode 2 Out (0-4(**))V(*)
8	Pilot GND2
9	NTC / PT100 / LM35 Supply 5V (*)
10	Pilot intensity control In (0-5)V (*)
11	NTC / PT100 / LM35 Signal (*)
12	No connection

* optional , ** max of 0.5V only for 19xxnm

We manufacture diode lasers.

Typical laser specifications at 25°C (*) (Preliminary data)

Wavelength at Pop [nm] (4)	Fiber Diameter [µm]	max. Power Pop [W] (1,2,3)	Operating Current [A] / Operating Voltage [V]
785/808	105	10	4 / 7
785/808	200	19	7 / 7
808	400	27	11 / 7
785/808	600	33	13 / 7.5
890	200	40	15 / 7
915/940/980	105	30	11 / 6.5
940/980	200	48	15 / 6.5
915/940/980	400	70	25 / 6.5
1064	200	40	15 / 6
1470	200	17	13 / 5.5
1470	400	22	21 / 5.5 .
1940	400	6	11 / 5.5
808 &1064 (dual)	200	8 & 20	7 / 4 & 15 | 3.5
808 &1064 (dual)	400	13 & 20	11 / 4 & 15 | 3.5
808 & 980 (dual)	400	13 & 33	11 / 4 & 25 | 3.5
980 &1470 (dual)	400	16 & 14	25 | 1.7 & 21 | 4
808 & 980 & 1064 (triple)	400	13 & 16 & 10	11 | 4 & 25 | 1.7 & 14 | 1.6
808 & 980 & 1064 (triple)	600	17 & 16 & 16	13 | 4 & 25 | 1.7 & 26 | 1.6
670 & 808 & 9xx (triple)	400	1.3 & 7 & 16	1.5 | 4.2 & 11 | 2 & 25 | 1.7

Parameter	Symbol / Conditions	Min	Typ	Max	Unit
Other General Features					
Conversion Efficiency (5)	depending 38% (7/8xxnm), 45% (9/10xxnm), 25% (14xxnm), 15% (19xxnm)				%
Spectral Shift with Temp. <1100nm	λT_Shift		0.3		nm / K
Spectral Shift with Temp. 14xxnm	λT_Shift		0.7		nm / K
Spectral Shift with Temp. 19xxnm	λT_Shift		1		nm / K
Fiber Centricity			±10 (±5µm for 105µm fiber core)		µm
Numerical Aperture	NA		0.22		
Fiber Connector Type			SMA905		
Pilot Beam (Option)					
Pilot Beam Output Power	red/green - adjustable (6)	0	1	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			<35/200	mA
Pilot Beam Intensity Control Voltage	red/green (7)	0(max. Intensity)		5(min. Intensity)	V
Sensors (Options)					
Power Monitor Supply Voltage				12	V
Power Monitor Signal Voltage		0		4(0.5V for 19xxnm)	V
Fiber Detection Sensor Supply Voltage				12	V
Fiber Detection Sensor Signal Voltage		0		12	V
Temperature Sensor			Standard NTC (10k) or optional (PT100 or LM35)		

Notes: * taken at internal temperature sensor, **Laser wavelength between 880nm and 920nm** require an AR <0.7% (+10nm around peak wavelength) coated fiber facet or end cap on fiber facet module side or power reduction of 30%. Avoid direct feedback from materials like mirrors, optics, processed material etc. back into laser module via the fiber cable by more than 10%.

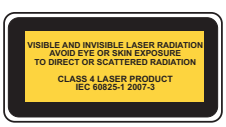
(1) Power is measured ex fiber according to given fiber specifications including measures and tolerances of fiber and ferrules for uncoated fiber facets (**exception see ***).
(2) Do not exceed maximum forward current by more than 5% above given operating current and if given by the maximum current otherwise 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) Individual configurations of wavelengths on request.
(5) For 670nm the conversion efficiency is about 30%.
(6) Adjust trimpot R6 when Intensity pin 10 control is left open.
(7) Adjust trimpot R4 to achieve 0%-100% pilot intensity for 5V to 0V at pin 10

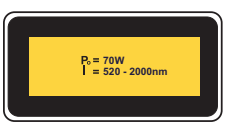
General Parameters / Accessories

Parameter	Symbol	Min	Typ	Max	Unit
Storage Temperature	T_S	-10		55	°C
Internal operating * and (Ambient) temp , c.w.-operation **	$T_{op\ c.w.}$	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			160		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.

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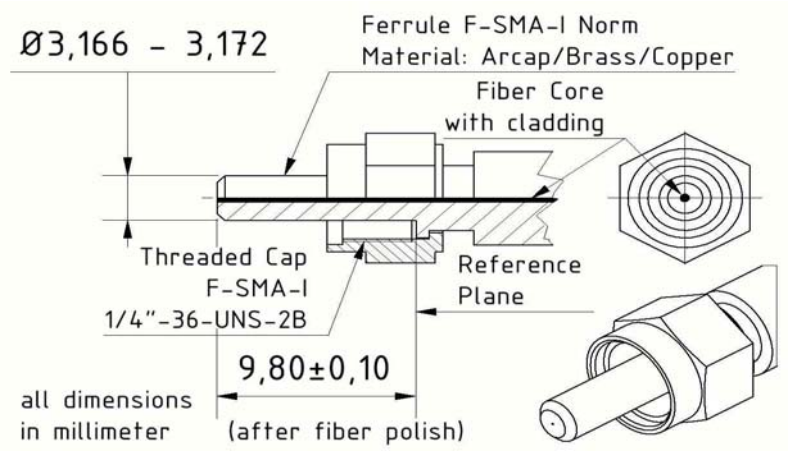
Fiber Connector

(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



PNEUM Co., Ltd.
5-15-3 Minamikoshigaya,Koshigaya-shi,
Saitama-ken,343-0845,Japan
TEL: 81-48-985-2720
FAX: 81-48-985-2721
info@pneum.co.jp 1808