

# Biophotonics & Industrial



## LaserBoxx

Same package for all colors

### Low Noise CW Monolithic DPSS benefits

- Interchangeable controller
- Low profile laser head (32mm)
- Tailored beam diameter capability (0.6 up to 1.4mm)
- Graphic User Interface with remote diagnostics

### Laser Diode modules benefits

- Controllers integrated into laser head
- Fast TTL and analog modulation
- Remote *ControlBoxx* with power display (CDRH)
- Optional clean up filter

### Common key features

- TEM<sub>00</sub> Beam
- Ultra Low Noise < 0.2% rms
- Beam pointing < 5 μm/°C
- USB and RS232 computer interface
- SM/PM/MM fiber coupling options
- Industry standard package (100x40x40 mm)

Super Resolution Imaging  
Confocal Microscopy  
Flow Cytometry  
DNA Sequencing  
Optogenetics  
Fluorescence Excitation

Polymer Curing  
Material Analysis  
Laser Marking

375 405 445 473 488 515 532 553 561 594 640 660 705 730 785

# Specifications

LBX-375 LBX-405 LBX-445 LBX-473 LBX-488 LBX-515 LBX-532 LMX-532L LMX-553L LMX-561L LBX-561\* LBX-594\* LBX-638

## Optical specifications

Package	LBX-LD							LMX-DPSS			LBX-LD		
Wavelengths	375	405	445	473	488	515	532	532	553	561	561*	594*	638
Wavelength range	± 5							± 1			± 2		+ 5/- 2
Linewidth	< 1.5							< 1			< 1		
Laser type	Laser Diode							DPSS			Doubled LD		

## Single Mode (TEM<sub>00</sub>)

Output Power	20, 70	50, 100 120, 300	100	100	50, 100 150, 200	80	50	100, 150 200, 300	25, 50 100, 200	25, 50, 100 200, 300	40	100, 150	
Power Stability over 8 hours and ±3°C, p-p	± 0.5							± 1			± 0.5		± 0.5
Optical Noise rms, 10Hz - 20MHz	< 0.5							< 0.2			< 0.2		< 0.5
Beam Diameter (typ.) at 1/e <sup>2</sup> , at 50mm from aperture	1.3 <sup>2</sup>	0.9 or 0.7 <sup>1</sup>	1.0 or 0.7 <sup>1</sup>		1.2 or 0.8 <sup>1</sup>		1.0		0.7		0.7	0.8 <sup>1</sup>	
Beam Divergence (typ.) at 1/e <sup>2</sup> , full angle, in far field	0.6 or 1.0 <sup>1</sup>						0.8		1.0		1.0	1.3 <sup>1</sup>	
Beam Circularity in far field	> 90												
Beam Quality (typ.)	< 1.35	< 1.25					< 1.2		< 1.1		< 1.25	< 1.25	
Polarization Ratio Vertical	> 100:1												
Beam Pointing stability	< 5												

## PM Fiber Coupling option

Output Power FC/APC connectors, 1.5m fiber length	Call	35, 70 85, 210	70	70	35, 70 100, 140	55	35	70 to 210	17 to 140	17 to 210	28	70, 100

## Modulation

Digital Modulation												
Rise / Fall time 10% - 90%	< 5 <sup>3</sup>	< 10							n/a		n/a	< 15
Extinction depth		100							n/a		n/a	100
Analog Modulation												
Bandwidth	> 0.4	> 1 (APC) / > 4 (ACC)					10 kHz		n/a		1	
3dB cut off frequency							20 μs		n/a		< 700	
Rise / Fall time 10% - 90%		< 700 (APC) / < 150 (ACC)							n/a			
Extinction depth		100							n/a		100	100

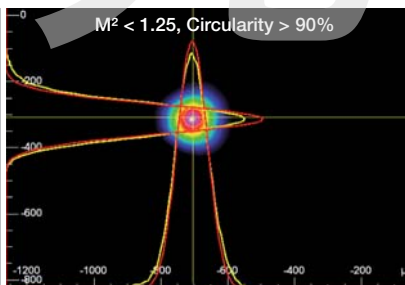
<sup>1</sup>Beam diameters and divergences for Circular Small Beam (CSB) versions  
Dedicated for laser combiner

<sup>2</sup> Elliptical Beam version available  
<sup>3</sup> 10 ns Rise/ Fall time for LBX 405-300

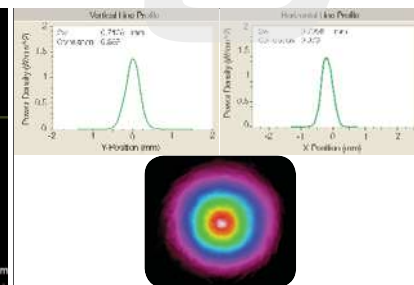
## DPSS Monolithic Resonator

The unique feature of the LaserBoxx DPSS is a proprietary, alignment-free monolithic resonator. The elements in the cavity are assembled into a single ultra-low-loss optical subsystem, using a proprietary crystal bonding technique.

A highly transparent compound, deposited on chemically activated end-faces of two crystals, creates a bond that is extremely robust over time, temperature variations, and insensitive to mechanical vibrations. Dielectric mirrors coated at the end-faces of the crystals complete the monolithic assembly with no moving parts.

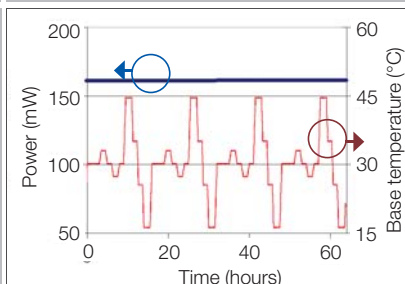


Beam Profile  
LBX-488-100-CIR-OE

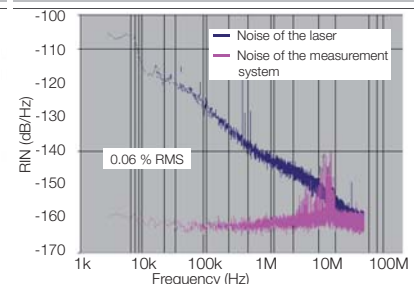


Beam Profile  
LMX-553L-200-COL-PP

Power Stability  
LMX-561L Power vs temperature



Relative Intensity Noise  
LMX-561L-200



## LBX-LD Platform

The LBX-LD line is a performing controller integrated platform for laser diode and 532 nm, 50 mW DPSS modules in 100 x 40 x 40 mm<sup>3</sup> industry standard package. The LaserBoxx provides superior beam quality, excellent stability and fast modulation capabilities.

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LBX-642	LBX-660	LBX-705	LBX-730	LBX-785	Units
LBX-LD					
642	660	705	730	785	
+3/-5	±5	±10	±5		nm
< 1.2		< 1.2			
Laser Diode					
130	100	30	30	130, 250*	mW
± 0.5					%
< 0.5					%
0.8 <sup>1</sup>		1.2 <sup>1</sup>			mm
1.3 <sup>1</sup>		1.0			mrad
> 90					%
< 1.25					M <sup>2</sup>
> 100:1					-
< 5					μrad/°C
90	70	20	20	90, 175*	mW
< 15					ns
100					%
> 1 (APC) / > 4 (ACC)					MHz
< 700 (APC) / < 150 (ACC)					ns
100					%

\* Preliminary specifications

## System Specifications

Package	LMX-DPSS		LBX-LD		Units
	P&P	OEM	P&P	OEM	
<b>Laser Head</b>					
Operating temperature measured at base, non condensing	10 - 45		10 - 50		°C
Start up time	< 10		< 2		min
Heat dissipation	Heatsink provided	< 20	< 10		W
Dimensions (LxWxH)	160 x 40 x 84	100 x 40 x 40 <sup>1</sup>			mm <sup>3</sup>
<b>Controller</b>					
Input Voltage	80 - 240 V AC	4 - 5.5 V DC	115 - 230 V AC	5 - 6.5 V DC	V
Input Current	-	< 8	-	< 2.5	A
Power Consumption	< 30	-	< 10	-	W
Dimensions <sup>1</sup> (LxWxH)	135 x 97 x 70	135 x 97 x 30	See ControlBoxx	Integrated into laser head	mm <sup>3</sup>
interfacing	RS232, USB, Analog				

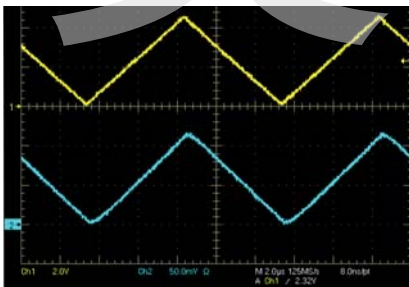
<sup>1</sup> Without heatsink  
P&P versions are CDRH compliant

## Custom Capabilities

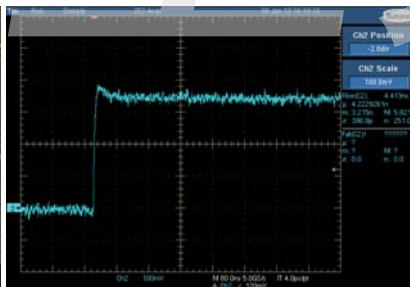
If your particular application requires additional features to take full benefit of the Oxixus laser performance, we would be happy to assist you with the design, development and production of these features.

Here are examples of what we offer :

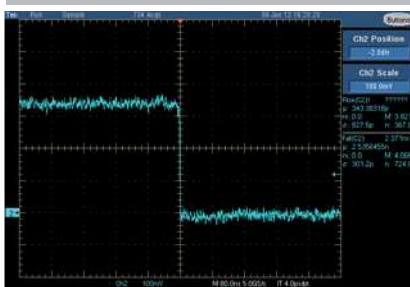
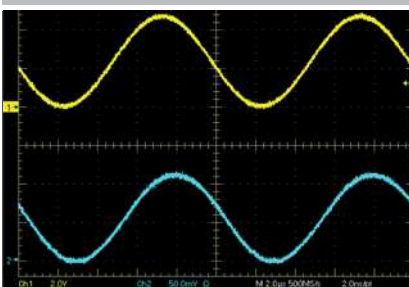
- o Power adjustment
- o Wavelength selection
- o Custom wavelengths
- o Opto-mechanical Subassemblies including:
  - Wavelengths combiner (LBX-4C)
  - AO modulator and AOTF
  - Specific beam diameter and beam shaping
- o Custom control interface
- o Extended operational temperature range



Analog Modulation  
LBX-405-100-CIR  
up to 4 MHz

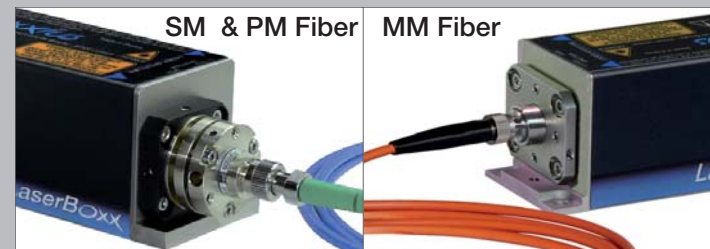


Digital Modulation  
LBX-488-100-CIR  
Rise / Fall times < 10 ns



## Fiber coupling options

Fiber coupling options offer rugged and compact solutions to couple LaserBoxx into Polarization Maintaining, Standard Monomode fiber or MM Fiber.



Specifications		
SM and PM Fiber		MM Fiber (50 μm, 0.22 NA)
> 70 %	Coupling Efficiency	> 80 %
100:1	Polarization Ratio	n/a
FC-APC	Fiber Output Connector	SMA
± 2 %	Power Stability over 8 hours, ± 1.5 °C	± 2 %
1.5 m	Fiber length	1.5 m



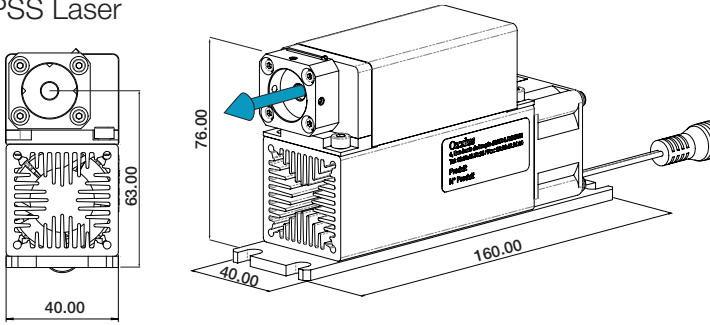
VISIBLE AND INVISIBLE LASER RADIATION  
AVOID EXPOSURE TO BEAM  
CLASS 3B LASER PRODUCT  
Power up to 500 mW

VISIBLE AND INVISIBLE LASER RADIATION  
AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION  
CLASS 4 LASER PRODUCT

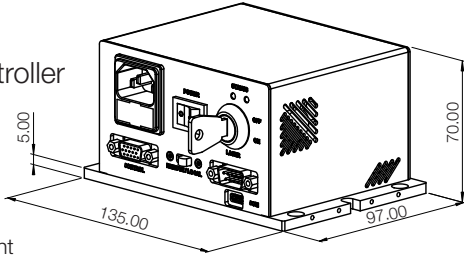


# Mechanical Drawings

LMX series, PP  
DPSS Laser

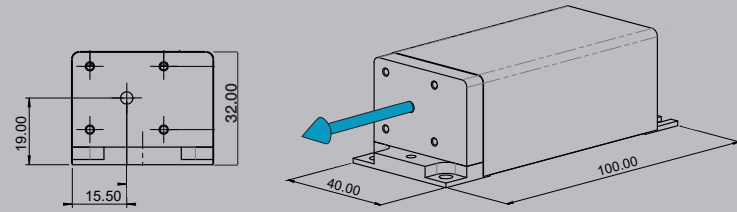


P&P Controller

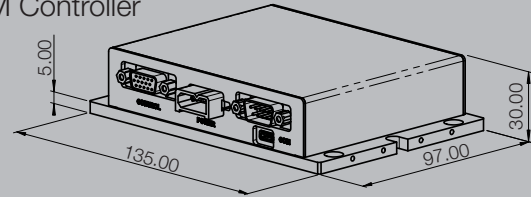


CDRH compliant

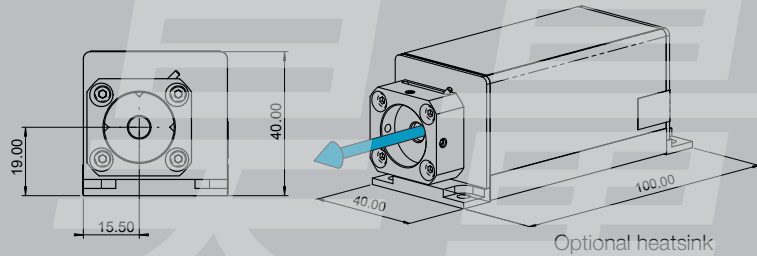
LMX series, OEM  
DPSS Laser



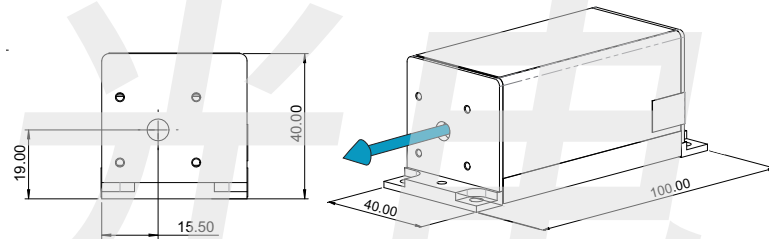
OEM Controller



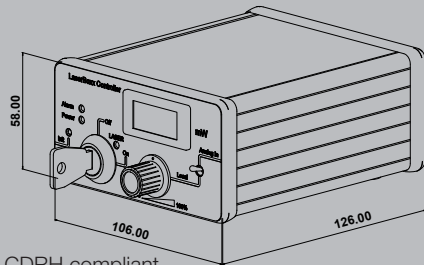
LBX-LD series, PP



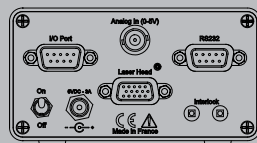
LBX-LD series, OEM



P&P remote ControlBoxx



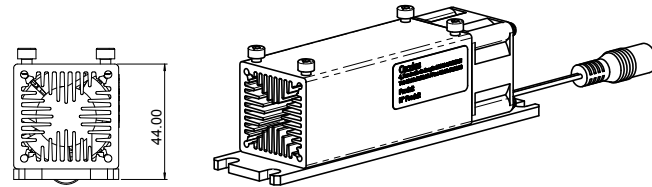
Rear view



CDRH compliant

LaserBoxx optional heatsink

Optional air-forced heat sink for maximum ambient temperature of 35°C. Including power supply.



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