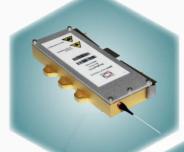


# OPIPHOTONICS

# HIGH-POWER LASER DIODES



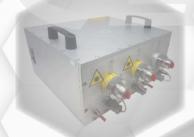
BrighteX Line
Fiber coupled
laser diodes





BrightboX Line

Laser diode systems



High-Power Laser Switch and Coupler





High-Power Laser Collimator and Optics

# HIGH-POWER LASER BEAM

DELIVERY SYSTEMS

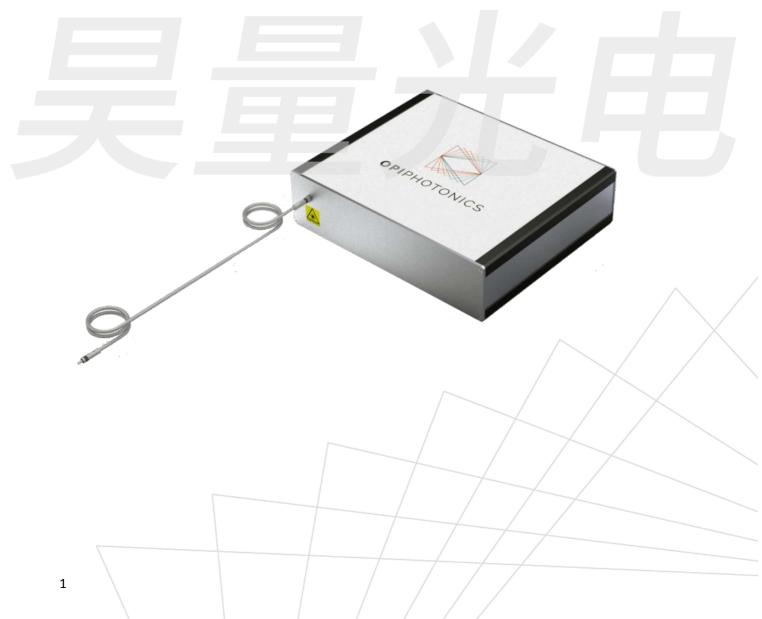
0





# BRIGHTBOX-E1

LASER DIODE ENGINE



上海昊量光电设备有限公司 Phone: 4006-888-532 WeChat; Auniontech Website: www.auniontech.com E-mail: info@auniontech.com





©2017 OPI Photonics S.R.L. All rights reserved.

OPI Photonics S.R.L. reserves the right to make changes to this document at any time without prior notice.

#### **OPI Photonics S.R.L.**

Registered Office	Operational Headquarters
Via Conte Rosso 3	Via Giovanni Schiaparelli 14
10121 Torino, Italy	10148 Torino, Italy



# 1 BrightboX-E1 overview

OPI BrightboX-E1 is a laser diode engine specifically designed to be used as a direct diode source or a pump unit for fiber laser engine. Off-the-shelf products include two variants with different configurations.

List of products:

Model	Wavelength	-	Power	-	Fiber Core	-	Page
Bb-E1-808-300W-200-00	808 nm		300 W		200 μm		4
Bb-E1-915-500W-200-00	915 nm		500 W		200 μm		5



## BRIGTHBOX-E1



#### 2 Bb-E1-808-300W-200:

#### **Applications**

- **DPSS** laser pumping
- Material processing

#### Optional

- Aiming beam
- Temperature sensors
- Scattered light sensors

# 2.1 Specifications

#### **Features**

- 300W output power
- 200µm/0.22NA delivery fiber

	Parameter	Unit	Minimum	Typical	Maximum
	CW output power	W	300		
]	Operating current (2)	Α		8	10
ical cs (:	Operating voltage (2)	V		36	42
opt	Threshold current	Α			1.5
tro	Rise and fall time (3)	μs			1
Electro-optical characteristics (1)	Wall plug efficiency	%	35	40	
<del>- 5</del>	Central wavelength	nm		808	
	Wavelength temperature gradient	nm/°C		0.3	
- 4	Fiber core diameter	μm		200	
S	Fiber cladding diameter	μm		220	
Cable teristi	Fiber NA	-		0.22	
Cable characteristics (4)	Cable type	-	Ø 5mm sta	rmoured cable	
ara	Cable length	m	4.5	5	5.5
5	Cable termination	-		SMA (5)	
, s	Cooling method	-		Liquid	
ng nent	Water connections ID/OD	mm		6/8	
Cooling	Input water temperature	°C	18		23
Cooling requirements	Water flow-rate	l/min	4		7
1 2	Cooling capacity	W	750		
r (c	Operating temperature	°C	15		45
Maximum ratings (6)	Relative humidity	%	35		60
laxi Iting	Storage temperature	°C	-20		85
≥ ½	Reverse voltage on PS pins	V			2

#### Notes

- (1) Values at 20°C cold plate temperature
- (2) Values for each power supply input (PS1, PS2, and PS3 connectors on technical drawing)
- (3) 10% to 90% of power, laser biased above threshold
- (4) Other options (fiber type, length, jackets, termination etc....) available upon request
- (5) AR coating available upon request
- (6) Exceeding absolute maximum ratings may lead to device degraded performance, shorter lifetime or sudden failure



#### 3 Bb-E1-915-500W-200:

#### **Applications**

- Fiber laser pumping
- Material processing

#### Optionals

- · Aiming beam
- Temperature sensors
- Scattered light sensors

# 3.1 Specifications

#### **Features**

- 500W output power
- 200µm/0.22NA delivery fiber

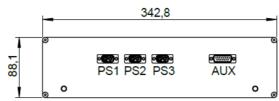
Parameter	Unit	Minimum	Typical	Maximum
CW output power	W	500		
Operating current (2)	Α		12	13
Operating voltage (2)	V		36	42
Threshold current	Α			1
Rise and fall time (3)	μs			1
Wall plug efficiency	%	45	50	
Central wavelength	Nm		915	
Wavelength temperature gradient	nm/°C		0.35	
Fiber core diameter	μm		200	
Fiber cladding diameter	μm		220	
Fiber NA	-		0.22	
Cable type	-	Ø 5mm stainless steel armoured ca		
Cable length	M	4.5	5	5.5
Cable termination	-		SMA (5)	
Cooling method	-		Liquid	
Water connections ID/OD	Mm		6/8	
Input water temperature	°C	18		23
Water flow-rate	l/min	4		7
Cooling capacity	W	1100		
Operating temperature	°C	15		45
Relative humidity	%	35		60
Storage temperature	°C	-20		85
Reverse voltage on PS pins	V			2
	CW output power Operating current (2) Operating voltage (2) Threshold current Rise and fall time (3) Wall plug efficiency Central wavelength Wavelength temperature gradient Fiber core diameter Fiber cladding diameter Fiber NA Cable type Cable length Cable termination Cooling method Water connections ID/OD Input water temperature Water flow-rate Cooling capacity Operating temperature Relative humidity Storage temperature	CW output power Operating current (2) A Operating voltage (2) Threshold current A Rise and fall time (3) Wall plug efficiency Central wavelength Nm Wavelength temperature gradient Fiber core diameter Fiber cladding diameter Fiber NA Cable type Cable length Cable termination Cooling method Water connections ID/OD Input water temperature Cooling capacity W Operating temperature C Relative humidity Storage temperature C V V V V V V V V V V V V C C C C C C	CW output power Operating current (2) Operating voltage (2) Threshold current Rise and fall time (3) Wall plug efficiency Central wavelength Nm Wavelength temperature gradient Fiber cladding diameter Fiber cladding diameter Fiber NA Cable type Cable length Cable termination Cooling method Water connections ID/OD Input water temperature Water flow-rate Cooling capacity W 1100 Operating temperature Relative humidity Storage temperature  "C V V V V V V V V V V V V V V V V V V	CW output power  Operating current (2)  Operating voltage (2)  Threshold current  Rise and fall time (3)  Wall plug efficiency  Central wavelength  Nm  915  Wavelength temperature gradient  Fiber core diameter  Fiber cladding diameter  Fiber NA  Cable type  Cable length  M  Water connections ID/OD  Mater flow-rate  Water flow-rate  Relative humidity  Storage temperature  W  500  A  12  A  15  A  45  50  Col.35  Fiber core diameter  µm  200  Fiber cladding diameter  µm  220  Fiber NA  -  0.22  Cable type  -  Ø 5mm stainless steel at a college of the college

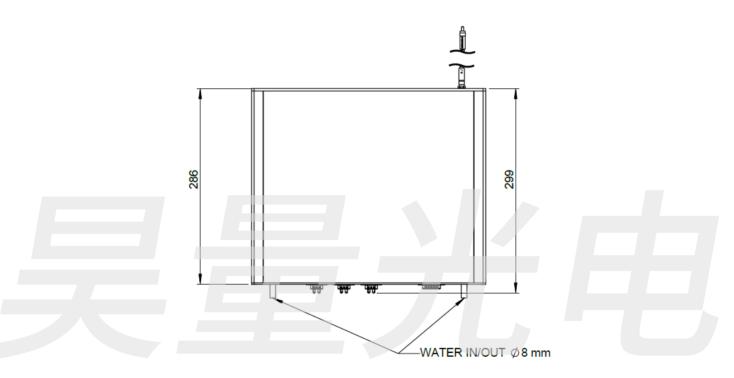
#### Notes

- (1) Values at 20°C cold plate temperature
- (2) Values for each power supply input (PS1, PS2, and PS3 connectors on technical drawing)
- (3) 10% to 90% of power, laser biased above threshold
- (4) Other options (fiber type, length, jackets, termination etc....) available upon request
- (5) AR coating available upon request
- (6) Exceeding absolute maximum ratings may lead to device degraded performance, shorter lifetime or sudden failure



# 4 Technical drawings



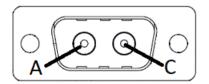


All dimensions are in millimetres.

## 5 Electrical connections

#### 5.1 Laser power supply connector:

Power Supply connector pinout (PS1, PS2, PS3):



- A Laser Anode (+)
- C Laser Cathode (-)

#### 5.2 Auxiliary connector:

The Auxiliary connector (AUX) is a 15 ways d-sub connector used as interface for the internal optional sensors.



#### 6 Customization

The BrightboX line of laser diode systems is conceived as a platform, so customizations are easily implemented. Both minor and major changes are possible.

Minor customizations are available also on the standard part numbers and involve the following items and are tracked by the "CC" suffix in the extended part number:

- · Fiber cable length
- · Aiming beam
- Temperature sensor (up to 10 sensors can be fitted)
- Scattered light sensor

Major customizations will apply to the components used inside the module and will change:

- Emission wavelength ("XXX" field of the extended part number)
- Multiple emission wavelengths ("XXX" field populated with alphabetic characters)
  - o up to 3 different wavelengths with independent power control with current configuration
  - o up to 6 wavelengths with independent power control by adding more PS connectors
- Output power ("YYY" field of the extended part number)
- Delivery fiber ("ZZZ" field of the extended part number)
- Cable type and termination (tracked by the "CC" suffix in the extended part number)
- Cable interlock (tracked by the "CC" suffix in the extended part number)

## 7 Ordering information

Extended part number: Bb-E1-XXX-YYYW-ZZZ-CC

Model	Wavelength	-	Power	-	Fiber Core	-	Customization
Bb-E1-808-300W-200-00	808 nm		300 W		200 μm		00 (standard) or 01-99
Bb-F1-915-500W-200-00	915 nm		500 W		200 um		00 (standard) or 01-99

#### GENERAL SAFETY PRECAUTIONS



## 8 General safety and operating precautions

#### 8.1 Electrostatic discharae (ESD)

ESD is the primary cause of device sudden failure. Use good ESD practice (wrist straps, dissipative working surfaces, air ionizers etc...) whenever handling the device.

#### 8.2 Operating instructions

Laser diodes may be damaged by excessive bias current or transient current spikes. Use proper electronics to drive the device.

Contact OPI Photonics for driving electronics recommendation and reference design solutions.

#### 8.3 Laser safety

Extremely dangerous invisible laser radiation is emitted by this laser diode when in operation. Laser radiation can be emitted by the laser only when connected to a power supply and current is flowing through the connecting pins.

Wear the proper protecting devices selected for the laser beam power and wavelength. Apply all safety measures in the area where the device is operated (warning signals, controlled access, safety interlocks).

This device is not certified for 21CFR 1040.10 or IEC 60825-1:2014, since it is meant for system integration. Certification is to be performed at system level.

#### **BrigtheX Line:**





AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION INVISIBLE LASER RADIATION

#### **BrightboX Line:**









# 9 Summary

1	Brig	htboX-E1 overview	3
2	Bb-I	E1-808-300W-200:	4
	2.1	Specifications	4
3	Bb-I	E1-915-500W-200:	5
	3.1	Specifications	5
4	Tecl	hnical drawings	6
5	Elec	trical connections	6
	5.1	Laser power supply connector:	6
	5.2	Auxiliary connector:	6
6	Cus	tomization	7
7	Ord	ering information	7
8	Gen	eral safety and operating precautions	8
	8.1	Electrostatic discharge (ESD)	8
	8.2	Operating instructions	8
	8.3	Laser safety	
9	Sum	nmary	9