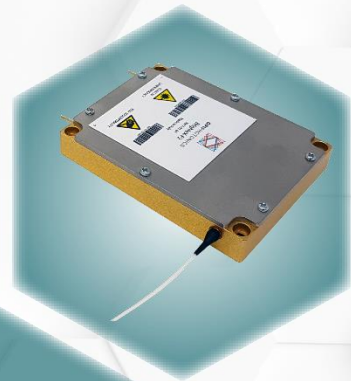


OPIPHOTONICS

HIGH-POWER LASER DIODES



BrighteX Line
Fiber coupled
laser diodes



BrightboX Line
Laser diode
systems

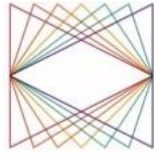


High-Power
Laser Switch
and Coupler



High-Power
Laser Collimator
and Optics

HIGH-POWER LASER BEAM DELIVERY SYSTEMS



BRIGHTEX-P1

HIGH-POWER FIBER COUPLED LASER DIODES



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1 BrighteX-P1 overview

OPI BrighteX-P1 is characterized by a rugged and reliable design based on beam stacking. Off-the-shelf products include four variants with different configurations.

List of products:

Model	Wavelength	-	Power	-	Fiber Core	-	Page
Bx-P1-808-50W-105-00	808 nm		50 W		105 μ m		4
Bx-P1-808-70W-200-00	808 nm		70 W		200 μ m		5
Bx-P1-915-90W-105-00	915 nm		90 W		105 μ m		6
Bx-P1-915-150W-135-00	915 nm		150 W		135 μ m		7

2 Bx-P1-808-50W-105:

Applications

- DPSS laser pumping
- Material processing

Features

- 50W output power
- 105 μ m/0.22NA delivery fiber
- 1030nm feedback protection
- 95% of power within 0.15 beam NA

2.1 Specifications

	Parameter	Unit	Minimum	Typical	Maximum
Electro-optical characteristics (1)	CW output power	W	50		
	Operating current	A		8	10
	Operating voltage	V		18	20
	Wall plug efficiency	%	35	45	
	Beam NA at 95% of power	-			0.17
	Central wavelength (2)	nm	803	808	812
	Wavelength temperature gradient	nm/ $^{\circ}$ C		0.3	
	Back-reflection isolation at 1020-1100nm	dB	30		
Fiber characteristics (3)	Fiber core diameter	μ m		105	
	Fiber cladding diameter	μ m		125	
	Fiber coating diameter	μ m		245	
	Fiber NA	-	0.20	0.22	0.24
	Fiber loose tubing diameter	mm	0.7		1.1
	Pigtail length	m	1.5		2
	Loose tubing length	mm	150		160
	Fiber bend radius	mm	30		
	Pigtail termination	-		None	
Maximum ratings (4)	Operating temperature	$^{\circ}$ C	15		30
	Relative humidity	%	35		60
	Storage temperature	$^{\circ}$ C	-20		85
	Lead soldering time	S			10
	Lead soldering temperature	$^{\circ}$ C			270

Notes

- (1) Values at 20 $^{\circ}$ C device base temperature
- (2) Other wavelengths available upon request.
- (3) Other options (fiber type, length, jackets, termination etc....) available upon request
- (4) Exceeding absolute maximum ratings may lead to device degraded performance, shorter lifetime or sudden failure

3 Bx-P1-808-70W-200:

Applications

- DPSS laser pumping
- Material processing

Features

- 70W output power
- 200 μ m/0.22NA delivery fiber
- 1030nm feedback protection
- 95% of power within 0.15 beam NA

3.1 Specifications

	Parameter	Unit	Minimum	Typical	Maximum
Electro-optical characteristics (1)	CW output power	W	70		
	Operating current	A		8	10
	Operating voltage	V		18	20
	Wall plug efficiency	%	40	50	
	Beam NA at 95% of power	-			0.15
	Central wavelength (2)	nm	803	808	812
	Wavelength temperature gradient	nm/ $^{\circ}$ C		0.3	
	Back-reflection isolation at 1020-1100nm	dB	30		
Fiber characteristics (3)	Fiber core diameter	μ m		200	
	Fiber cladding diameter	μ m		220	
	Fiber coating diameter	μ m		320	
	Fiber NA	-	0.20	0.22	0.24
	Fiber loose tubing diameter	mm	0.7		1.1
	Pigtail length	m	1.5		2
	Loose tubing length	mm	150		160
	Fiber bend radius	mm	30		
	Pigtail termination	-		None	
Maximum ratings (4)	Operating temperature	$^{\circ}$ C	15		30
	Relative humidity	%	35		60
	Storage temperature	$^{\circ}$ C	-20		85
	Lead soldering time	S			10
	Lead soldering temperature	$^{\circ}$ C			270

Notes

- (1) Values at 20 $^{\circ}$ C device base temperature
- (2) Other wavelengths available upon request.
- (3) Other options (fiber type, length, jackets, termination etc....) available upon request
- (4) Exceeding absolute maximum ratings may lead to device degraded performance, shorter lifetime or sudden failure

4 Bx-P1-915-90W-105:

Applications

- Fiber laser pumping
- Material processing

Features

- 90W output power
- 105 μ m/0.22NA delivery fiber
- 1050nm feedback protection
- 95% of power within 0.15 beam NA

4.1 Specifications

	Parameter	Unit	Minimum	Typical	Maximum
Electro-optical characteristics (1)	CW output power	W	90		
	Operating current	A		10	11
	Operating voltage	V		15.6	16.3
	Wall plug efficiency	%	50	56	
	Beam NA at 95% of power	-			0.15
	Central wavelength (2)	nm	905	915	925
	Wavelength temperature gradient	nm/°C		0.3	
	Back-reflection isolation at 1050-1100nm	dB	30		
Fiber characteristics (3)	Fiber core diameter	μ m		105	
	Fiber cladding diameter	μ m		125	
	Fiber coating diameter	μ m		245	
	Fiber NA	-	0.20	0.22	0.24
	Fiber loose tubing diameter	mm	0.7		1.1
	Pigtail length	m	1.5		2
	Loose tubing length	mm	150		160
	Fiber bend radius	mm	30		
	Pigtail termination	-		None	
Maximum ratings (4)	Operating temperature	°C	15		30
	Relative humidity	%	35		60
	Storage temperature	°C	-20		85
	Lead soldering time	S			10
	Lead soldering temperature	°C			270

Notes

- (1) Values at 20°C device base temperature
- (2) Other wavelengths available upon request.
- (3) Other options (fiber type, length, jackets, termination etc....) available upon request
- (4) Exceeding absolute maximum ratings may lead to device degraded performance, shorter lifetime or sudden failure

5 Bx-P1-915-150W-135:

Applications

- Fiber laser pumping
- Material processing

Features

- 150W output power
- 135 μ m/0.22NA delivery fiber
- 1050nm feedback protection
- 95% of power within 0.15 beam NA

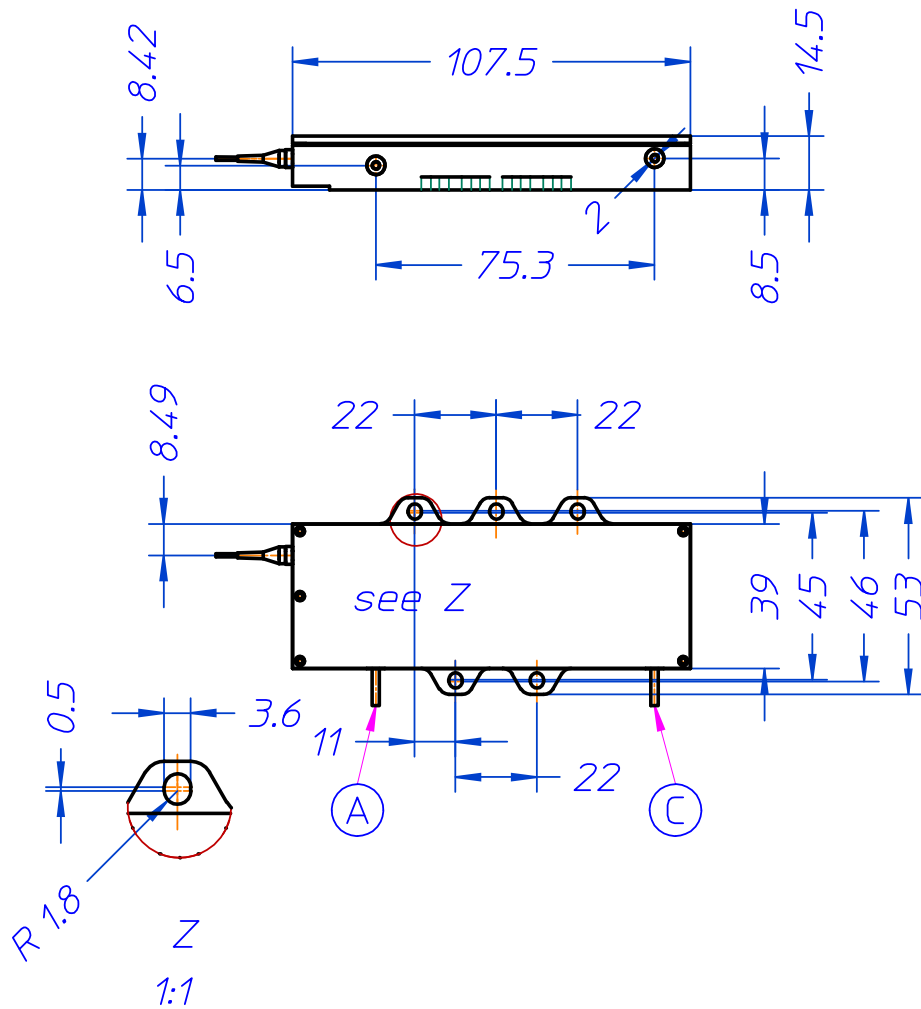
5.1 Specifications

	Parameter	Unit	Minimum	Typical	Maximum
Electro-optical characteristics (1)	CW output power	W	150		
	Operating current	A		18	20
	Operating voltage	V		17	18.5
	Wall plug efficiency	%	49	55	
	Beam NA at 95% of power	-			0.15
	Central wavelength (2)	nm	905	915	925
	Wavelength temperature gradient	nm/°C		0.3	
	Back-reflection isolation at 1050-1100nm	dB	30		
Fiber characteristics (3)	Fiber core diameter	μ m		135	
	Fiber cladding diameter	μ m		155	
	Fiber coating diameter	μ m		320	
	Fiber NA	-	0.20	0.22	0.24
	Fiber loose tubing diameter	mm	0.7		1.1
	Pigtail length	m	1.5		2
	Loose tubing length	mm	150		160
	Fiber bend radius	mm	31		
	Pigtail termination	-	None		
Maximum ratings (4)	Operating temperature	°C	15		30
	Relative humidity	%	35		60
	Storage temperature	°C	-20		85
	Lead soldering time	S			10
	Lead soldering temperature	°C			270

Notes

- (1) Values at 20°C device base temperature
- (2) Other wavelengths available upon request.
- (3) Other options (fiber type, length, jackets, termination etc....) available upon request
- (4) Exceeding absolute maximum ratings may lead to device degraded performance, shorter lifetime or sudden failure

6 Technical drawings



All dimensions are in millimetres.

7 Pinout

The BrighteX-P1 pinout is the following:

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



8 Customization

The BrighteX line of high power laser diode 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 pigtail length
- Fiber pigtail termination (SMA or other connectors)
- Loose tubing length
- Package temperature sensor

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

- Emission wavelength (“XXX” field of the extended part number)
- Output power (“YYY” field of the extended part number)
- Delivery fiber (“ZZZ” field of the extended part number)

9 Ordering information

Extended part number: Bx-P1-XXX-YYYW-ZZZ-CC

Model	Wavelength	-	Power	-	Fiber Core	-	Customization
Bx-P1-808-50W-105-00	808 nm		50 W		105 μm		00 (standard) or 01-99
Bx-P1-808-70W-200-00	808 nm		70 W		200 μm		00 (standard) or 01-99
Bx-P1-915-90W-105-00	915 nm		90 W		105 μm		00 (standard) or 01-99
Bx-P1-915-150W-135-00	915 nm		150 W		135 μm		00 (standard) or 01-99

10 General safety and operating precautions

10.1 Electrostatic discharge (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.

10.2 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.

10.3 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:



BrightboX Line:





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