BLOOM
LASERS FOR INDUSTRY

SCAN ME

CAREX 50-515

High power nanosecond visible laser with programmable pulses for high speed and precision micromachining

CAREX, the flexible nanosecond visible fiber laser, delivers fully programmable pulses combining high power and high pulse repetition rates. It is especially designed for high precision micro-processing.

CAREX combines process agility and throughput for demanding applications such as multi-material stacks processing. It delivers pulses from 2 ns up to 20 ns with any arbitrary temporal shape and possible burst operation. The innovative fast electronic design enables instantaneous switching between 2 pulse patterns for optimized complex material processing.

The fiber technology combined with the simply efficient laser head architecture makes CAREX a robust, flexible, and cost-effective visible laser for most demanding industrial applications. Manufactured with field proven and qualified components, good practices and high-quality, CAREX is the right answer to 24/7 operations in extended production cycle environments.

Wavelength	**515 nm**
Power	50 W up to 400 kHz
Pulse Duration	2 ns – 20 ns fully adjustable Programmable pulses Burst mode
Pulse Energy	Up to 500 µJ
Beam quality	$M^2 < 1.2$

Advantages

- High power 50 W up to 400 kHz
- High Pulse Repetition Rate up to 1500 kHz
- Adjustable pulse duration from 2 ns up to 20 ns
- Full pulse shaping (1 ns resolution)
- Excellent beam quality $M^2 < 1.2$ up to 1 500 kHz
- High peak power up to 60 kW
- Field proven technology
- HALT designed / HASS Certified

Applications

- Solar Cells processing
- Glass processing
- PERC processing
- ITO patterning
- CFRP processing
- Battery processing
- Ceramic scribing, cutting and drilling
- Material processing

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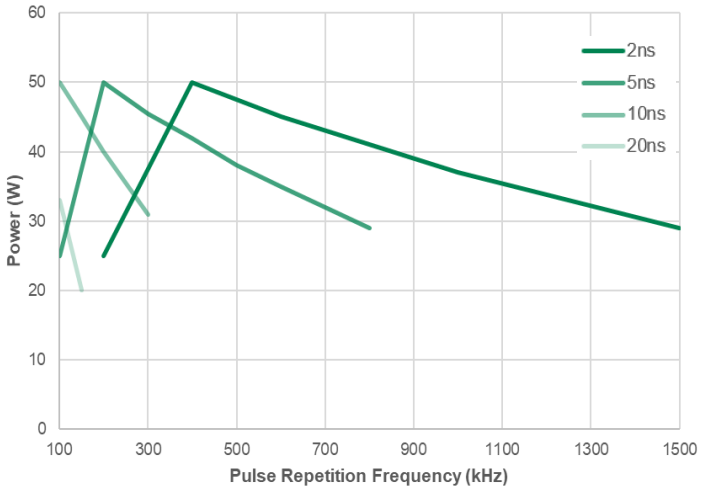
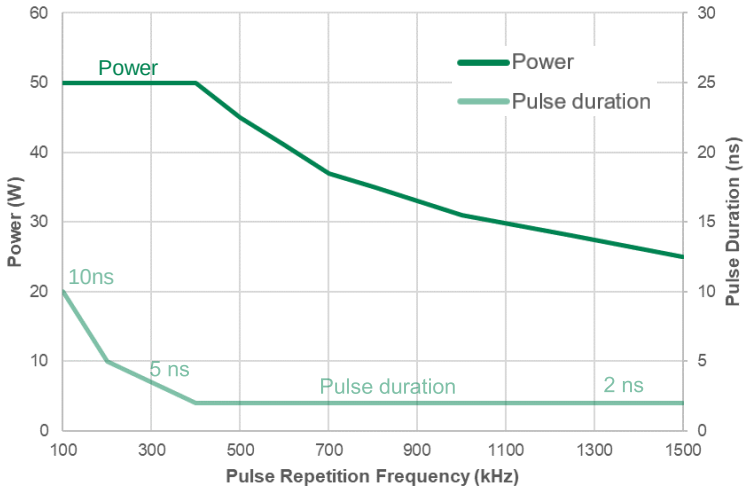
Typical performances

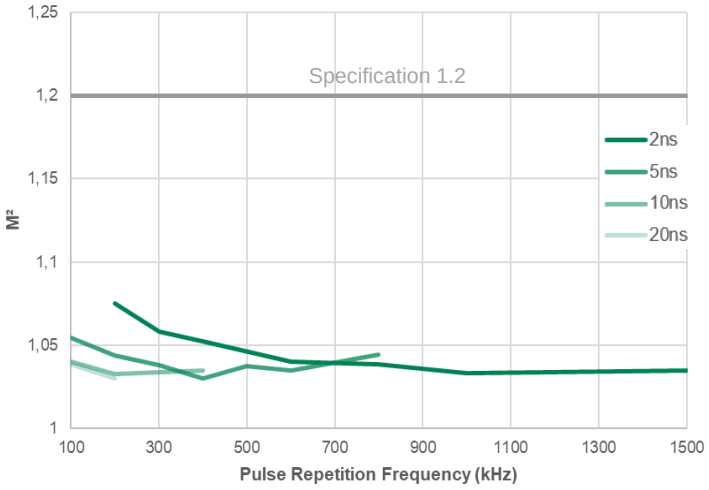
Power



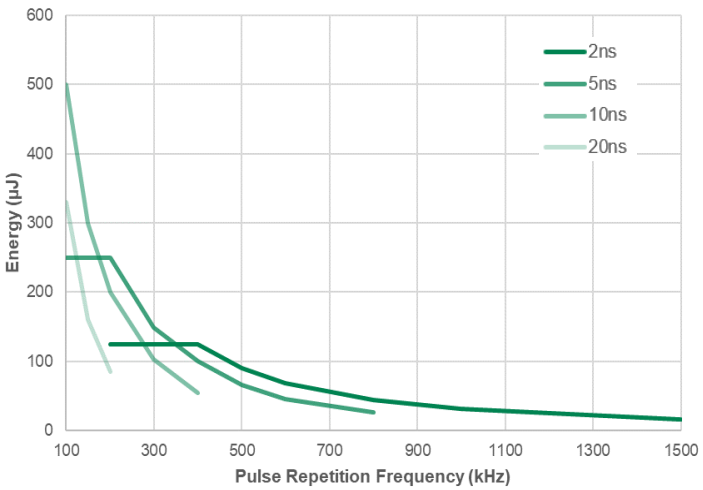
Typical Operating Conditions



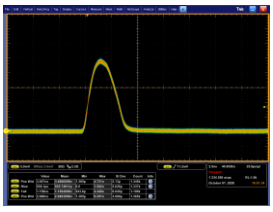
M²



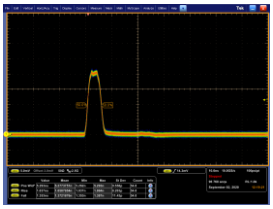
Pulse Energy



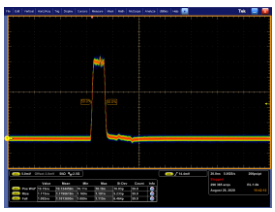
Programmable Pulses



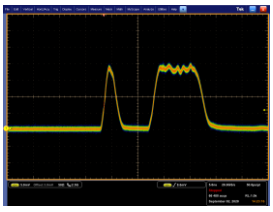
2 ns



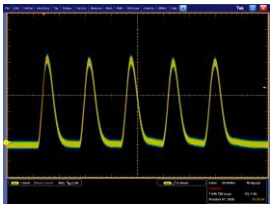
5 ns



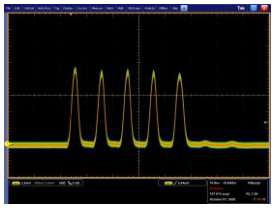
10 ns



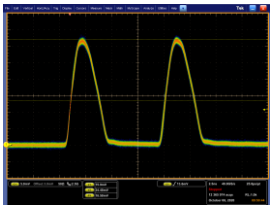
2 ns + 10 ns ; Δ = 10 ns



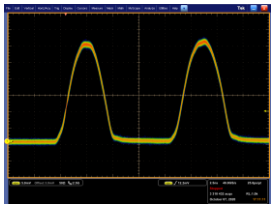
5 x 2 ns ; Δ = 2 ns



5 x 3.5 ns ; Δ = 5 ns



2 x 2 ns ; Δ = 2 ns



2 x 3.5 ns ; Δ = 5 ns

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Specifications

Output Characteristics				
Center Wavelength	515 nm ± 0.1 nm			
Average Power	2 ns	5 ns	10 ns	20 ns
	50 W @ 400 kHz	50 W @ 200 kHz	50 W @ 100 kHz	33 W @ 100 kHz
Pulse Width	Fully programmable from 2 ns to 20 ns			
Pulse Repetition Rates	Single-shot to 1500 kHz			
Power Stability	< 2%, 2σ over 8 hours			
Pulse to Pulse Energy Stability	< 3% RMS			
Beam Characteristics				
Spatial Mode	TEM_{00}			
M^2	≤ 1.2			
Polarization Ratio	≥ 100:1 linear			
Polarization Direction	Vertical, ± 2°			
Beam Divergence (full-angle)	< 0.45 mrad			
4σ Beam Diameter @ exit (nominal)	3.5 mm ± 0.35 mm			
Waist Location (from exit face of output window)	0 m ± 4 m			
Astigmatism	≤ 30%			
Beam Circularity	≥ 90%			
Long Term Beam Pointing Stability, over 8 hours	≤ 25 µrad, full-angle			
Operating Conditions				
External Communications	Ethernet / RS-232 / USB			
Warm-up Time				
Cold Start	≤ 30 minutes			
Warm Start	≤ 10 minutes			
Electrical Requirements	100 – 240V AC			
Line Frequency	50 to 60 Hz			
Power Consumption	< 900 W			
Temperature Range	15°C to 35°C (59°F to 95°F)			
Humidity	10% to 95% RH, non-condensing			
Storage Conditions				
Temperature	0°C to 50°C (32°F to 122°F)			
Humidity	5% to 95% RH			
Altitude (non-operational)	Sea level to 11 000 meter			
Chiller Requirements				
Cooling Water Temperature	25°C +/- 0,1°C			
Minimum Cooling Power	700 W			
Cooling Water Flow	5 liter/min, 3 liter/min minimum			
Physical Characteristics				
Dimensions (L x W x H)	Laser Head : 1146 x 250 x 169 mm (45.11 x 9.84 x 6.65 in) Control Unit : 506 x 483 x 177 mm (19.92 x 19.01 x 6.97 in)			
Weight	Laser Head : 50 kg (110 lbs) without water Control Unit : 25 kg (55 lbs)			
Features				
Extended Internal Power Monitoring	Power monitored at each stage of the laser			
Ultra Wide Operation Range	Constant pulse width and beam parameters between 100 kHz and 1 500 kHz			
Industry Ready Data Logging	Long-term and short-term laser operation log, diagnosis, maintenance			
Alignment Beam	Low power mode for laser installation and alignment			
Sacrificial Window	Field Replaceable Unit			
Advanced Support	Industry 4.0 ready, remote control, remote support, >30 sensors in laser head			
Best Practices	Sealed laser head, multi-stage components cleaning and assembled in ISO 6 cleanroom			

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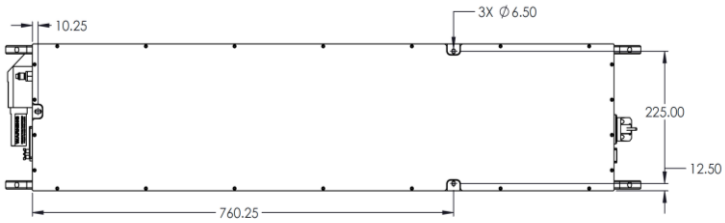
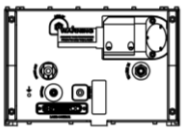
CAREX 50-515 Drawings

Laser Head (in mm)

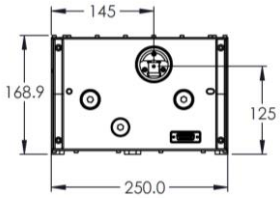


Bottom View

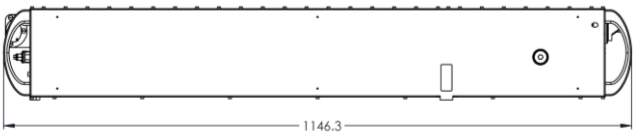


Rear View

Top View

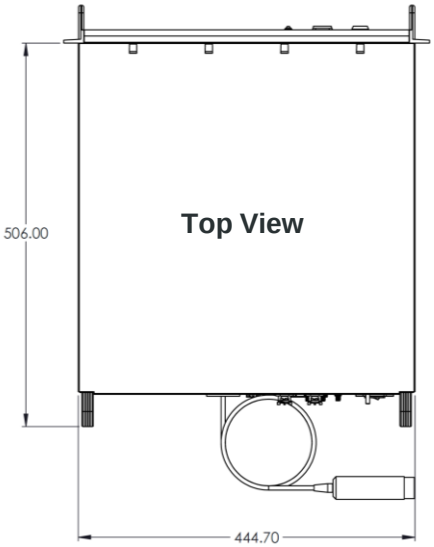


Front View

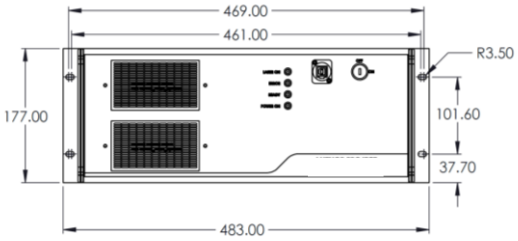


Side View

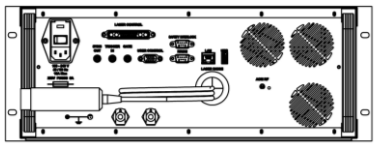
Power Supply (in mm)



Top View



Front View



Rear View

According to BLOOM continuous product improvements, specifications and drawings are subject to change without notice.

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