

YUCCA 60-343

High power short nanosecond UV laser for high-speed precision micromachining

YUCCA, the UV fiber laser, provides high power at high pulse repetition rates with short nanosecond pulses. It is fully designed to improve laser process quality with shorter pulse widths and increase productivity with higher pulse repetition rates.

Its innovative patented fiber design enables a unique combination of short nanosecond pulses, performance for high-speed process and reduced overall processing cost. With a constant short nanosecond pulse duration and beam quality over the whole pulse repetition rate range, YUCCA is the right laser source for the next generation of UV laser micromachining equipment targeting higher throughput.

YUCCA is designed with high-end methodologies to exceed industrial quality standards and to guarantee reliability and serviceability. Manufactured with field proven technology and qualified components, good practices and high-quality, YUCCA is the right answer for 24/7 operations in extended production cycle environments.

Wavelength	343 nm
Power (*) (*) 7.5 ns pulse duration	60 W up to 400 kHz 25 W at 1000 kHz
Pulse Duration (**) (**) Factory set	2 ns, 5 ns, 7.5 ns, 10 ns or burst mode
Beam quality	$M^2 < 1.2$



Advantages

- ✓ High power 60 W up to 1 MHz
- ✓ Short pulses 2 ns up to 2.5 MHz
- ✓ Excellent beam quality $M^2 < 1.2$ up to 2.5 MHz
- ✓ High peak power up to 60 kW
- ✓ Field proven technology
- ✓ Long UV crystal lifetime
- ✓ HALT designed / HASS Certified
- ✓ 2 ns, 5 ns, 7.5 ns, 10 ns or burst

Applications

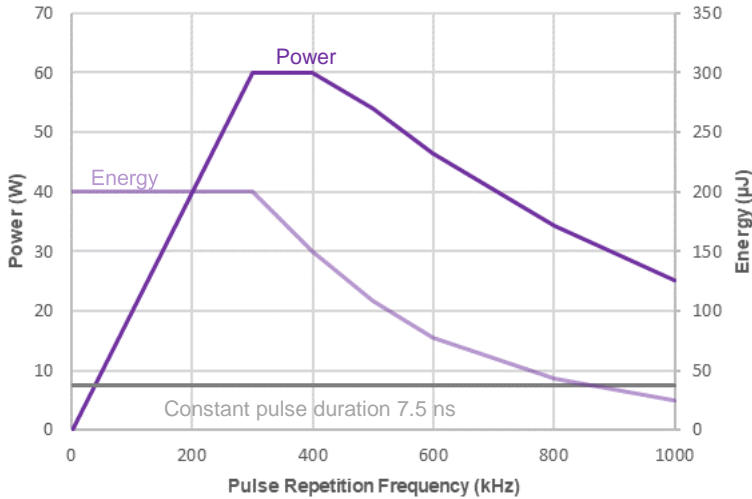
- ✓ PCB via drilling, cutting and depaneling
- ✓ ITO patterning
- ✓ Wafer scribing and debonding
- ✓ Glass processing
- ✓ CFRP processing
- ✓ Battery processing
- ✓ Ceramic scribing, cutting and drilling
- ✓ Material texturing



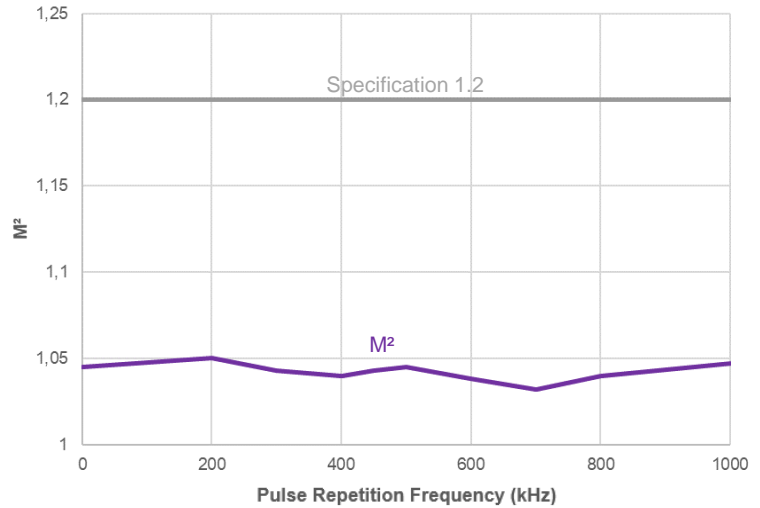
YUCCA 60-343

Typical performances

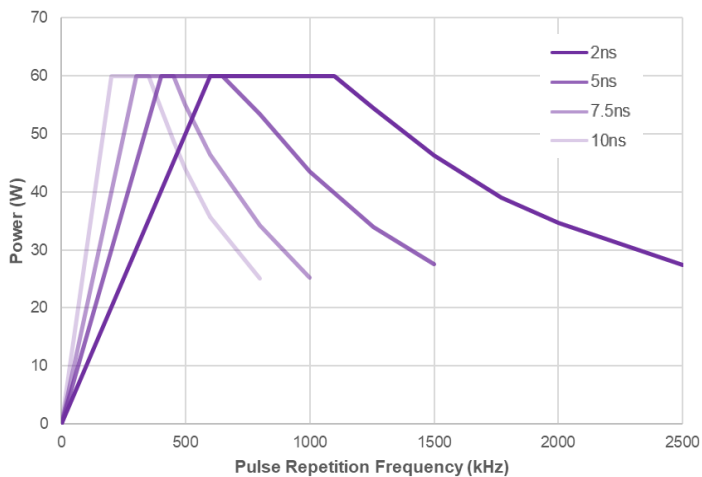
Power, Energy at 7.5 ns



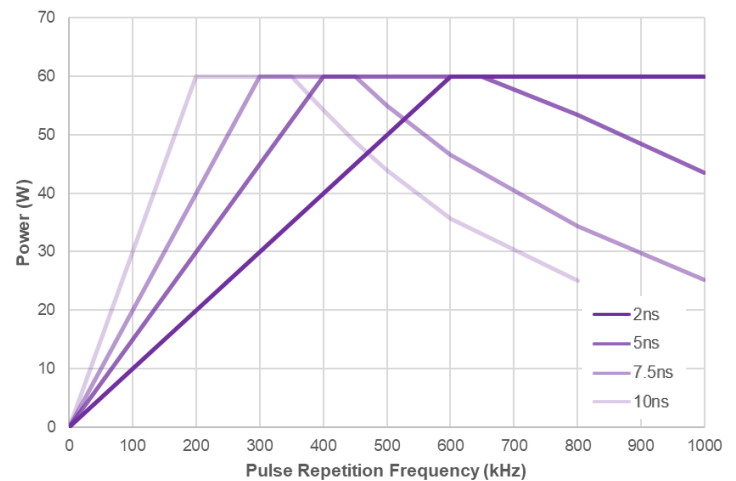
M²



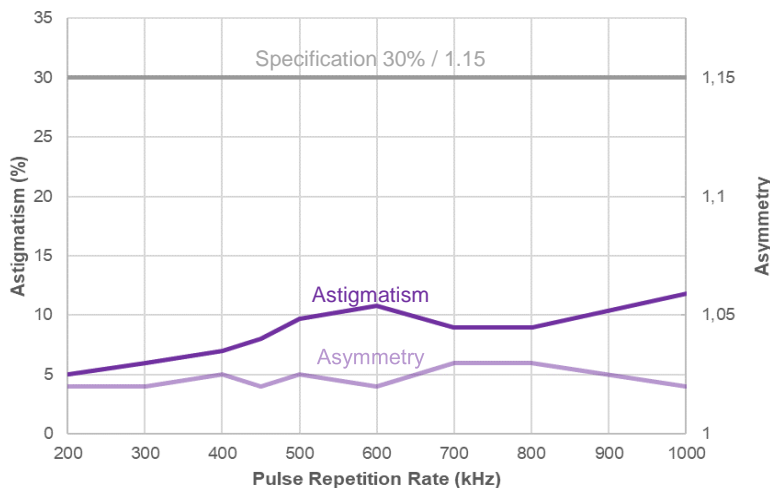
Power between 0 – 2.5 MHz



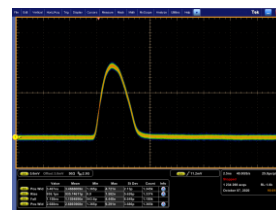
Power between 0 – 1 MHz



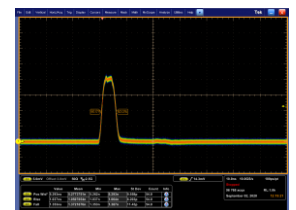
Astigmatism and Asymmetry at 7.5 ns



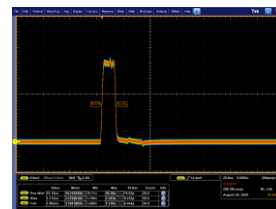
Factory Set Pulses



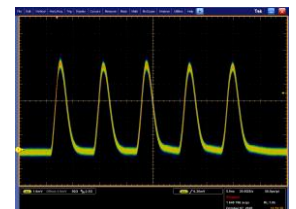
2 ns



5 ns



10 ns



5 x 2 ns ; Δ = 2 ns



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Specifications

Output Characteristics

Central Wavelength	343.3 nm ± 0.5 nm				
Average Power (*) (**)	2 ns	5 ns	7.5 ns	10 ns	Burst
(*) Pulse duration to be chosen by customer between 2 ns and 10 ns and factory set	60 W @ 600 kHz	60 W @ 400 kHz	60 W @ 300 kHz	60 W @ 200 kHz	
(**) Burst available on request	60 W @ 1 MHz	60 W @ 600 kHz	60 W @ 400 kHz	60 W @ 300 kHz	(**)
	25 W @ 2.5 MHz	25 W @ 1.5 MHz	25 W @ 1 MHz	25 W @ 800 kHz	
Pulse Width	2 ns, 5 ns, 7.5 ns, 10 ns or burst				
Pulse Repetition Rates	Single-shot to 2 500 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)	< 0.3 mrad
4σ Beam Diameter @ exit (nominal)	3.5 mm ± 0.35 mm
Waist Location (from exit face of output window)	0 m ± 12 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	≤ 2 minutes
Electrical Requirements	100 – 240V AC
Line Frequency	50 to 60 Hz
Power Consumption	< 1200 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

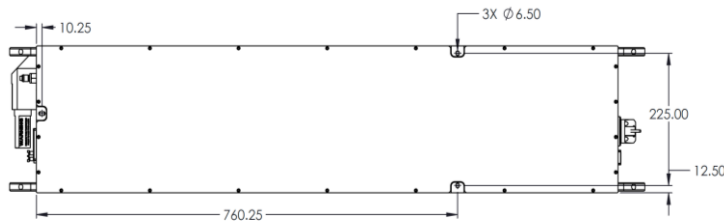
Physical Characteristics

Dimensions (L x W x H, mm)	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 over the whole pulse repetition rate range
Industry Ready Data Logging	Long-term and short-term laser operation log, diagnosis, maintenance
Alignment Beam	Low power mode level 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

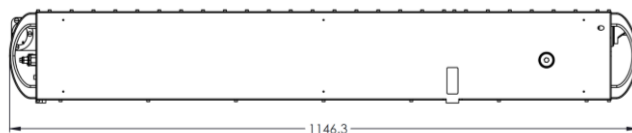
Laser Head (in mm)



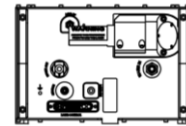
Bottom View



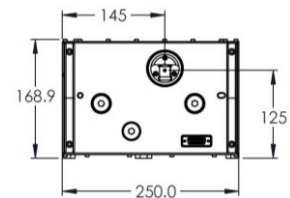
Top View



Side View

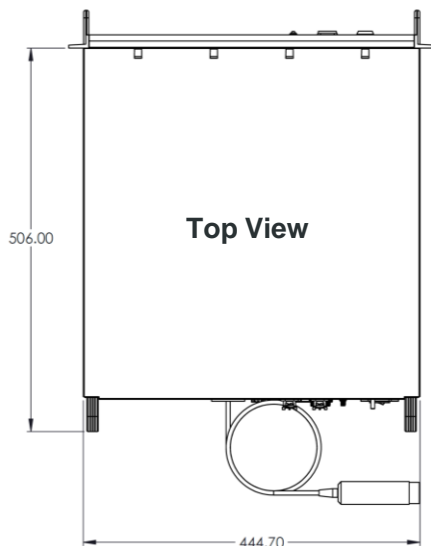


Rear View

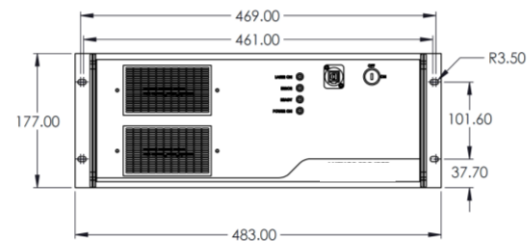


Front View

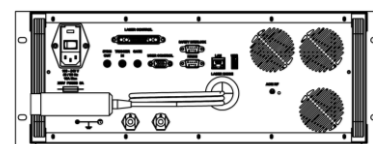
Power Supply (in mm)



Top View



Front View



Rear View

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