Single-Frequency High-Power Nanosecond Laser

PULSELAS™-A-1064-10W-SF

The **PULSELAS™-A-1064-10W-SF** is a powerful, diode-pumped, single-frequency, nanosecond laser system which delivers 1 mJ pulse energy at 10 kHz pulse repetition rate. It operates at the fundamental wavelength of 1064 nm. Frequency conversions to 532 nm, 355 nm and 266 nm wavelengths are optional. The distinctive features of this laser like near-transform-limited spectral width, simultaneously high average and peak powers, diffraction-limited output beam, etc. make it an ideal choice for numerous scientific and industrial applications, including optical meteorology, interferometry, high-resolution laser spectroscopy, fiber communications, single pulse holography and many others. The Ethernet connection allows easy access and control of the laser system even in remote, hard-to-reach or hazardous areas.

Features

- ***Single frequency*** *(single longitudinal mode)*
- ***High-energy*** *nanosecond pulses*
- ***< 40 MHz*** *spectral width*
- *Nearly* ***bandwidth transform-limited*** *pulses*
- ***1 mJ*** *pulse energy at 1064 nm wavelength*
- ***10 W*** *average power at 1064 nm wavelength*
- ***80 kW*** *peak power at 1064 nm wavelength*
- *Nearly* ***diffraction-limited*** *beam quality*
- *Optionally available* ***532***, ***355*** *and* ***266 nm***
- *Remote control via Ethernet*

Applications

- *High-Resolution Laser Spectroscopy*
- *Nonlinear Frequency Conversion*
- *Fiber Bragg Grating Fabrication*
- *Optical Meteorology*
- *Remote Sensing*
- *Interferometry*
- *Lithography*
- *Holography*

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Technical Specifications: Typical Values

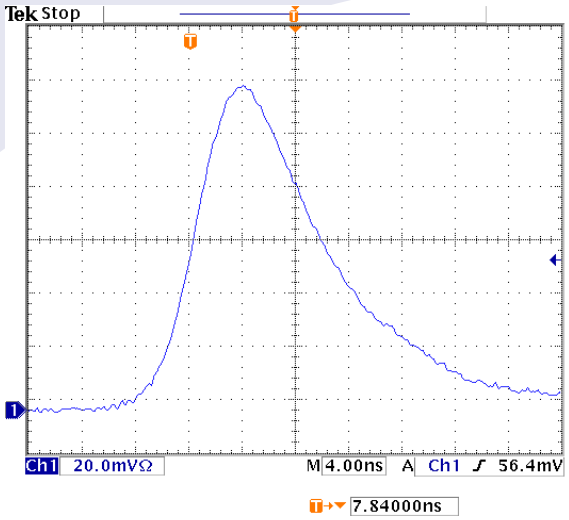
OPTICAL CHARACTERISTICS					
Parameter	**Unit**	**Fundamental**	**Harmonics (optional)**		
Wavelength	nm	**1064**	**532**	**355**	**266**
Pulse Energy	mJ	1	0.45	0.25	0.08
Pulse Width	ns	< 12	10	< 10	< 10
Peak Power	kW	> 80	> 38	> 25	8
Average Power	W	10	4.5	2.5	0.8
Spectral Width	MHz	< 40	< 50	< 50	< 50
Repetition Rate	kHz	10 [1)]	10 [1)]	10 [1)]	10 [1)]
Power Stability	% rms	1 [4)]	4	7	8
Beam Quality, M^2	nm	< 1.2	< 1.4	< 1.6	< 1.6
Beam Diameter ($1/e^2$)	mm	1.4 (±10%) [2)]	Available on request		
Beam Divergence	mrad	1.0 (±10%)	Available on request		
Beam Ellipticity	%	> 90	Available on request		
Spatial Beam Profile		TEM_{00}			
Pulse-to-CW Average Power Contrast		1:150 > 1:10,000 on request			
Pulse-to-CW Peak Power Contrast		$1:15x10^6$ $> 1:10x10^{10}$ on request			
Polarization (linear)		> 100:1	$> 10^4$:1	$> 10^5$:1	$> 10^5$:1
CW Single Frequency Monitor		Optional [3)]			

MECHANICAL CHARACTERISTICS		
	Dimensions	**Weight**
Laser Head	344 x 120 x 600 mm^3	11 kg
Laser Diode Driver	483 x 89 x 341 mm^3	8 kg
Recirculating Chiller	483 x 132 x 615 mm^3	14 kg

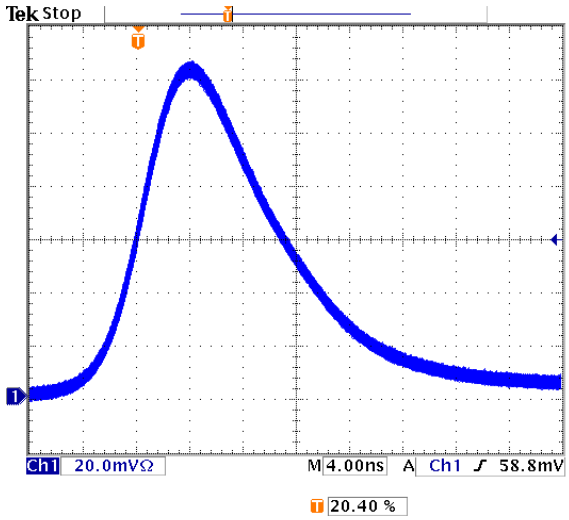
GENERAL CHARACTERISTICS	
Power Requirements	100 – 240 V AC
Power Consumption	max. 600 W
Operating Temperature Range	20 °C – 28 °C
Laser Head Cooling	Closed loop water chiller
Typical Warm-Up Time [4)]	< 5 min (95% of typical power)
Humidity	max. 70%, non-condensing
Sync Out	TTL
Remote Control	Ethernet (LAN), RJ-45

Note: *[1)] Other repetition rates are available on request.*
[2)] Beam expansion is available on request.
[3)] 5 mW CW single frequency free space beam.
[4)] For full power and stability the warm-up time is 30 min.

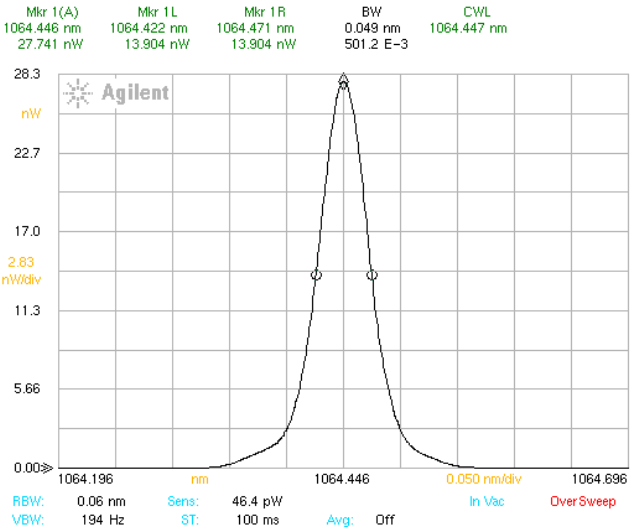
Performance of PULSELAS™-A-1064-10W-SF: Typical Values



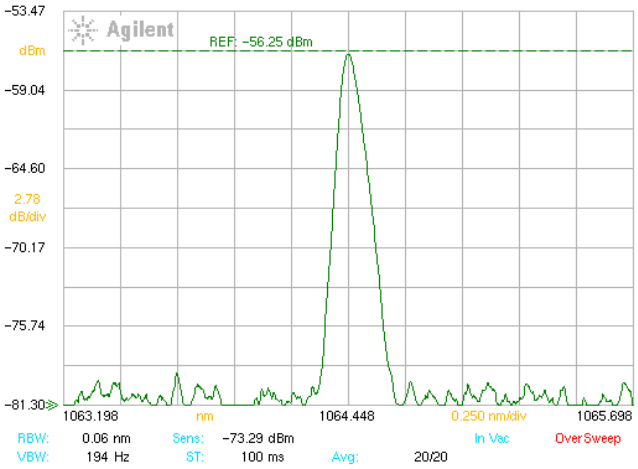
Pulse form at 1064 nm wavelength: Single shot.



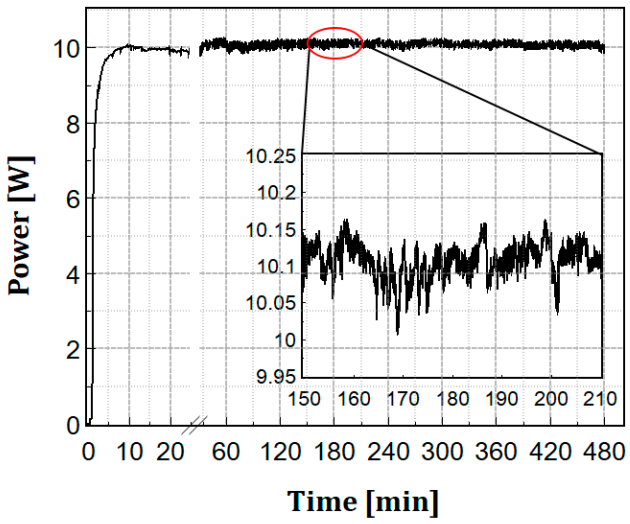
Pulse form at 1064 nm wavelength: 10^5 pulses.



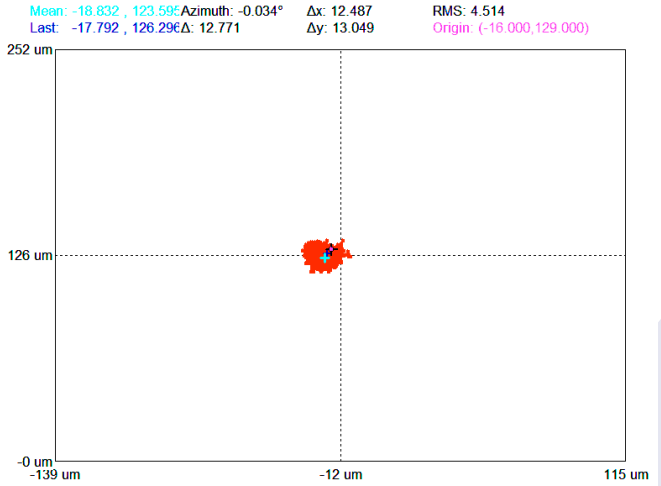
Laser output spectrum: Linear scale.
The measured spectral width is instrument-limited.



Laser output spectrum: Logarithmic scale.
Side-mode suppression is better than -25 dB.



Long-term stability of laser output power at 1064 nm.



Beam pointing stability at 1064 nm.

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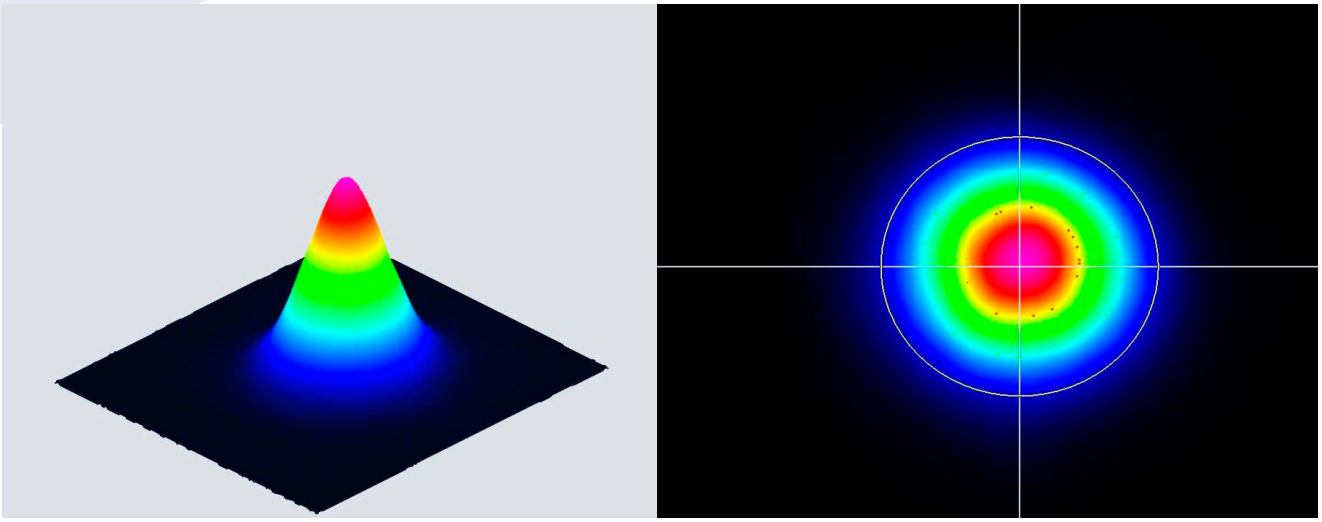
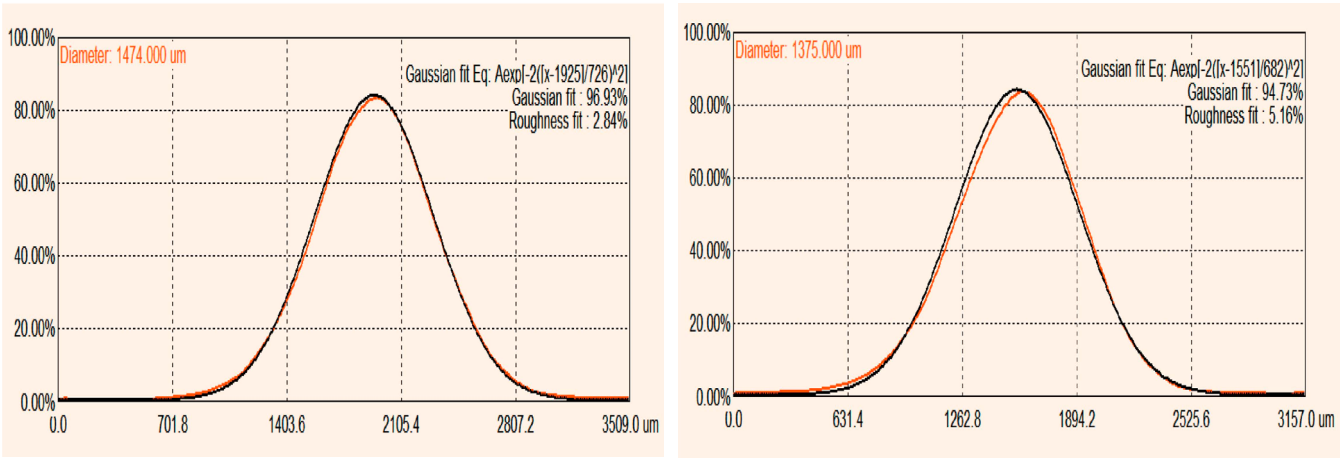
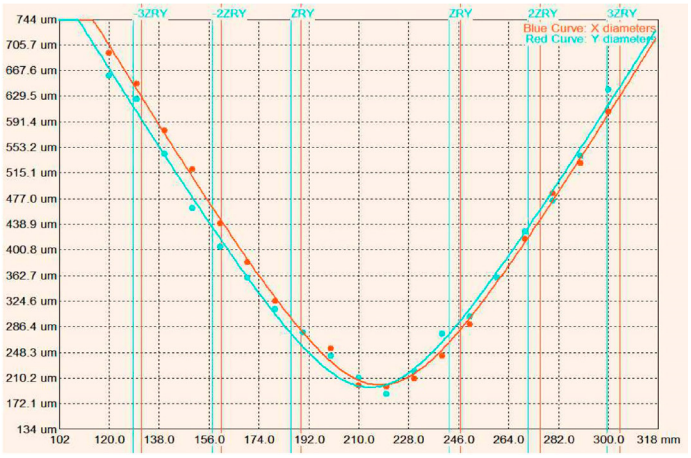
Performance of PULSELAS™-A-1064-10W-SF: Typical Values



3D and 2D 1064 nm far-field beam profile measured at ~300 mm distance after laser output.



Beam cross-sections in the horizontal and vertical planes and Gaussian fits.

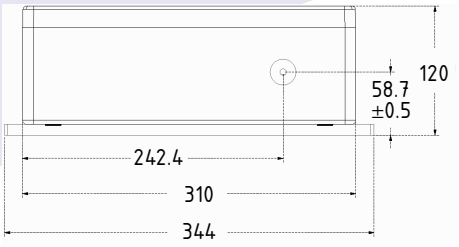


Beam quality measured according to ISO 11146 standard.

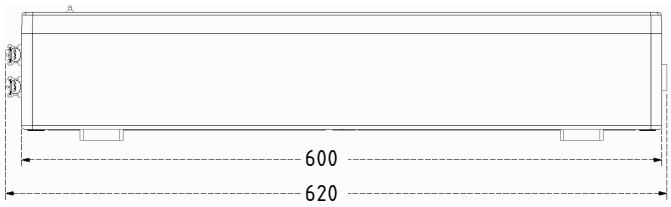
M^2_{eff} = 1.01
Div_{eff} = 1.08 mrad
BPP_{eff} = 0.338 mrad*mm
$Z_{0,eff}$ = 396 mm

Outline Drawings of PULSELAS™-A-1064-10W-SF

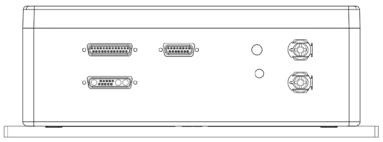
Dimensions in mm



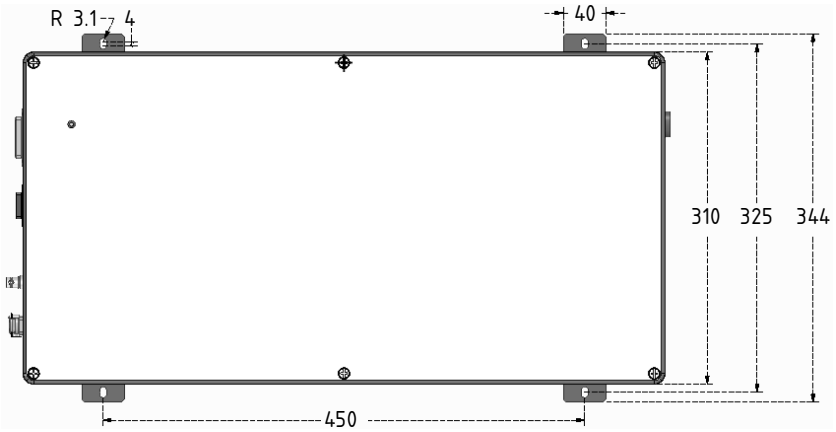
Front View



Side View



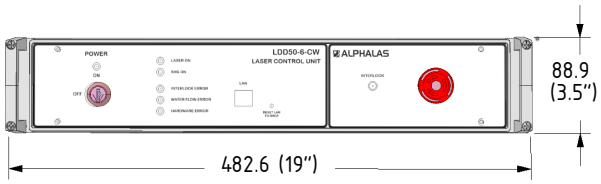
Rear View



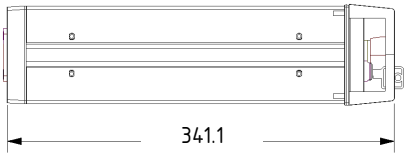
Top View

Outline Drawings of Laser Diode Driver: LDD50-6-CW

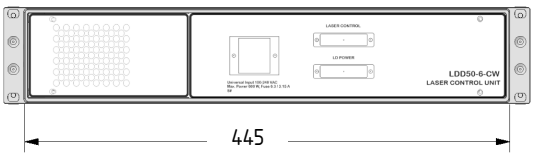
Dimensions in mm



Front View



Side View



Rear View

DANGER – VISIBLE AND INVISIBLE LASER RADIATION
AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION
CLASS 4 LASER PRODUCT
IEC / EN 60825-1

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