



HELIOS

Actively Q-Switched Compact DPSS sub-ns Laser

The lasers of the HELIOS series are compact, rugged systems with high pulse energy and pulse duration of only a few hundred picoseconds. This allows for a precision and quality in micromachining and microelectronics applications which are not possible with nanosecond lasers.

HELIOS MOPA (Master Oscillator/Power Amplifier) technology makes high power generation and power scaling especially efficient. In contrast to standard acousto-optical (AOM) devices HELIOS electro-optical (EOM) Q-switch operates faster and more precise. This results in an outstanding pulse control – a must for e.g. contour processing and applications that demand a precise pulse overlap.

HELIOS lasers are designed for industrial 24/7 operation. Due to their excellent beam quality including beam pointing, their compactness and digital control the lasers can be exchanged quickly without significant downtime of the user's tool. The infrared and green HELIOS versions come with identical form, fit, function allowing the user for an easy and quick wavelength change.

HELIOS lasers are the right economic choice for surface-near applications like thin-film processing, scribing, dicing, and marking.

FEATURES

- Pulse-width: 600 ps to 900 ps
- High output power
 - Up to 6W at 1064 nm
 - Up to 3.75W at 532 nm
- Repetition rate from single-shot up to 125 kHz
- Exact pulse control
- High beam quality: $TEM_{00}/M^2 < 1.25$
- Excellent pointing stability

APPLICATIONS

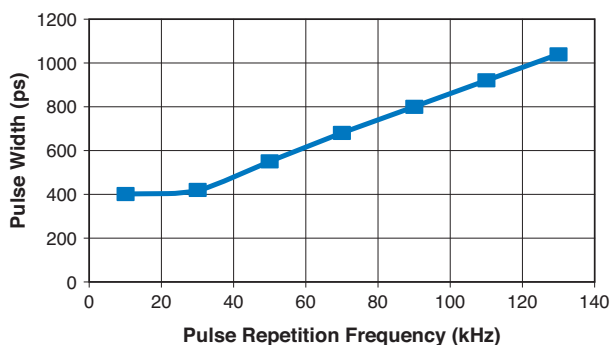
- Thin-Film Scribing
- LED Dicing
- Marking, Engraving
 - Ceramics, Glass, Sapphire, Diamond
- Repair
 - Displays, Memories, etc.



SPECIFICATIONS	HELIOS 1064-2.5-50	HELIOS 1064-5-50	HELIOS 1064-6-125
Wavelength (nm)		1064	
Average Power ¹ (W)	2.5	5.0	6.0
Pulse Energy ¹ (at nominal values) (μJ)	>50	>100	>45
Pulse Repetition Frequency Range (kHz)	Single-shot to 70	Single-shot to 70	Single-shot to 125
Nominal Pulse Repetition Frequency (kHz)	50	50	125
Pulse Width (ns)	<0.79	<0.69	<0.95
Spatial Mode		TEM ₀₀	
M ² (Beam Quality)		<1.25	
Beam Diameter, 1/e ² (mm)	3.5	2.5	2.5
Polarization		> 50:1, vertical	
Jitter (ns)			
between sequential pulses, gating mode	<±2	<±2	<±2
trigger to laser pulse, single pulse triggering	<±2	<±5	<±5
Laser Assembly Type	Type A	Type B	Type B
Laser Head Size (W x H x L)	128 x 177 x 270 mm (5.0 x 7.0 x 10.6 in.)	128 x 104 x 257 mm (5.0 x 4.1 x 10.1 in.)	128 x 104 x 257 mm (5.0 x 4.1 x 10.1 in.)
Laser Electronics Size (W x H x L)	integrated	150 x 45 x 130 mm (5.9 x 1.8 x 5.1 in.)	150 x 45 x 130 mm (5.9 x 1.8 x 5.1 in.)
Laser Head Weight	9.5 kg (20.9 lbs.)	5.6 kg (12.3 lbs.)	5.6 kg (12.3 lbs.)
Laser Electronics Weight	integrated	1.4 kg (3.0 lbs.)	1.4 kg (3.0 lbs.)
Operating Baseplate Temperature (°C)		20 to 30	
Operating Ambient Temperature (°C)		15 to 45	
Storage Condition (°C)		-10 to +50	
Relative Humidity (%)		<80	
Cable Length Laser Head (m)	none	1	1
Operating Voltage (V)		24 ±2	

¹ Average power/pulse energy at nominal repetition rate, maximum decrease over warranty <10%.

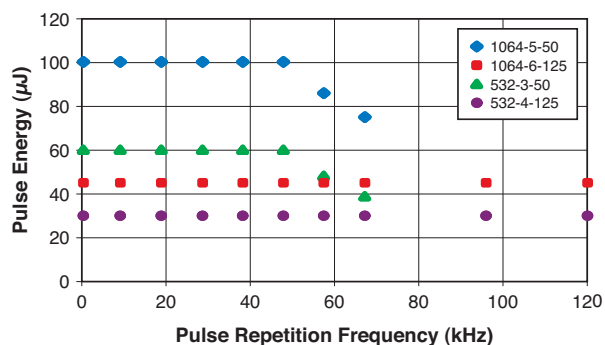
Typical Pulsewidth vs Repetition Frequency



SPECIFICATIONS	HELIOS 532-1-50	HELIOS 532-1.5-50	HELIOS 532-3-50	HELIOS 532-4-125
Wavelength (nm)	532			
Average Power ¹ (W)	1.0	1.5	3.0	3.75
Pulse Energy ¹ (at nominal values) (μJ)	>20	>30	>60	>30
Pulse Repetition Frequency Range (kHz)	Single-shot to 70	Single-shot to 70	Single-shot to 70	Single-shot to 125
Nominal Pulse Repetition Frequency (kHz)	50	50	50	125
Pulse Width (ns)	<0.69	<0.69	<0.69	<0.85
Spatial Mode	TEM ₀₀			
M ² (Beam Quality)	<1.25			
Beam Diameter, 1/e ² (mm)	2.0			
Polarization	> 50:1, vertical			
Jitter (ns)				
between sequential pulses, gating mode	<±2	<±2	<±2	<±2
trigger to laser pulse, single pulse triggering	<±2	<±2	<±5	<±5
Laser Assembly Type	Type A	Type A	Type B	Type B
Laser Head Size (W x H x L)	128 x 177 x 270 mm (5.0 x 7.0 x 10.6 in.)	128 x 177 x 270 mm (5.0 x 7.0 x 10.6 in.)	128 x 104 x 257 mm (5.0 x 4.1 x 10.1 in.)	128 x 104 x 257 mm (5.0 x 4.1 x 10.1 in.)
Laser Electronics Size (W x H x L)	integrated	integrated	150 x 45 x 130 mm (5.9 x 1.8 x 5.1 in.)	150 x 45 x 130 mm (5.9 x 1.8 x 5.1 in.)
Laser Head Weight	9.5 kg (20.9 lbs.)	9.5 kg (20.9 lbs.)	5.6 kg (12.3 lbs.)	5.6 kg (12.3 lbs.)
Laser Electronics Weight	integrated	integrated	1.4 kg (3.0 lbs.)	1.4 kg (3.0 lbs.)
Operating Baseplate Temperature (°C)	20 to 30			
Operating Ambient Temperature (°C)	15 to 45			
Storage Condition (°C)	-10 to +50			
Relative Humidity (%)	<80			
Cable Length Laser Head (m)	none	none	1	1
Operating Voltage (V)	24 ±2			

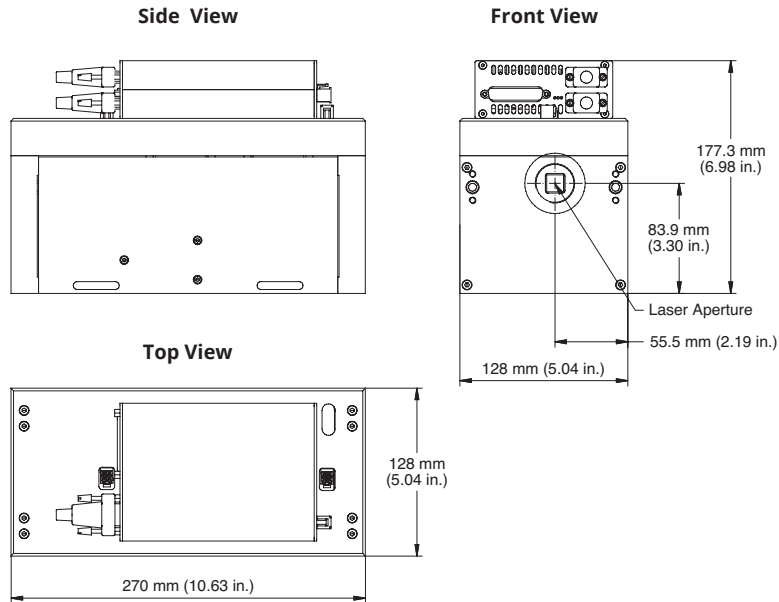
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Typical Pulse Energy vs Repetition Frequency

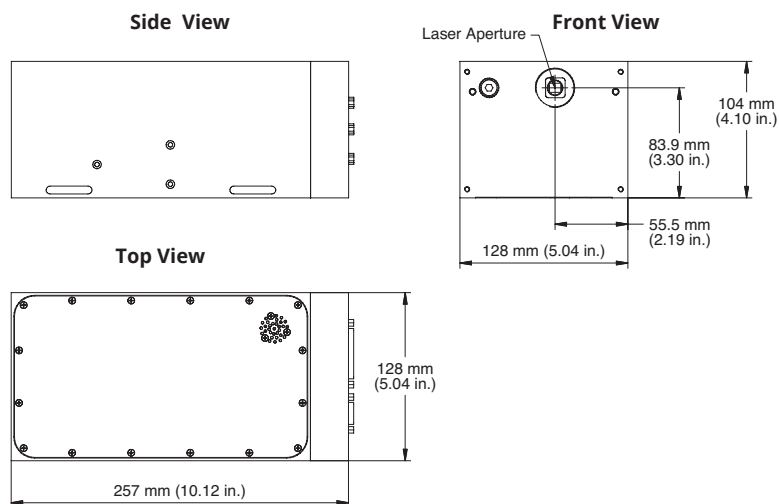


MECHANICAL SPECIFICATIONS

HELIOS - Assembly Type A



HELIOS - Assembly Type B



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Coherent follows a policy of continuous product improvement. Specifications are subject to change without notice. Coherent's scientific and industrial lasers are certified to comply with the Federal Regulations (21 CFR Subchapter J) as administered by the Center for Devices and Radiological Health on all systems ordered for shipment after August 2, 1976.

Coherent offers a limited warranty for all HELIOS lasers. For full details of this warranty coverage, please refer to the Service section at www.Coherent.com or contact your local Sales or Service Representative. Printed in the U.S.A. MC-010-13-1M0117Rev.C Copyright ©2017 Coherent, Inc.

