helix

Picosecond Fiber Laser

nLIGHT's helix™ picosecond fiber laser is the industry's first cost-effective solution for high-precision micro-materials processing. Designed to meet the highest quality and reliability standards for maintenance-free 24/7 industrial operation, the air-cooled system provides a near-diffraction-limited, high-peak-power, short pulsed beam at 1064 nm. The small footprint of the laser head coupled with an intuitive user interface allows for ease of integration into any laser machine tool.

The nLIGHT helix™ platform leverages nLIGHT's industry-leading diode and fiber technology to deliver a high-performance pulsed fiber laser solution:

- High brightness, ultra-reliable fiber-coupled diodes
- nLIGHT liekki™ state-of-the-art, Chirally-Coupled Core (3C®) fiber technology. 3C® fiber provides unmatched beam quality and stability from a fiber capable of achieving multi-hundred kW peak power
- Proprietary seed technology that enables ultra-stable, configurable pulses with highly flexible parameters including burst mode, pulse duration and repetition rate

The nLIGHT helix™ picosecond fiber laser platform is designed and manufactured to meet the high-performance and high-reliability requirements of 24/7 industrial production.

Features

- Burst mode
- Burst shaping
- High peak power (300 kW)
- Configurable pulse widths from 50 ps to 400 ps
- User selectable repetition rates from 50 kHz to 10 MHz
- Air-cooled
- Flexible modular design enables high user uptime
- Near diffraction-limited beam

Applications

- Sapphire scribing
- Stealth dicing
- Glass processing
- FPD processing
- Flex circuit patterning
- Semiconductor processing
- Marking and engraving

nLIGHT

Typical Device Specifications

15 W

Parameter	Units	Specification			
Pulse energy	µJ	15			
Output peak power	kW	300			
Output average power	W	1.5	3.75	7.5	11.25
Repetition rate	kHz	100	250	500	750
Pulse width	ps	50			
Center wavelength	nm	1064 ± 2 nm			
Power variation	%	≤ 2% rms			
Beam diameter	mm	2			
Beam divergence	mrad	5			
Beam quality	M^2	1.2 typical			

25 W

Parameter	Units	Specification			
Pulse energy	µJ	15			
Output peak power	kW	300			
Output average power	W	15	18.75	22.5	25
Repetition rate	kHz	1000	1250	1500	1700
Pulse width	ps	50			
Center wavelength	nm	1064 ± 2 nm			
Power variation	%	≤ 2% rms			
Beam diameter	mm	2			
Beam divergence	mrad	5			
Beam quality	M^2	1.2 typical			