

QTekLaser™ 1064 nm Fiber Laser

Product Description

The **QTekLaser™ 1064 nm Fiber Laser** delivers ultra-stable, narrow-linewidth (<20 kHz) output at power levels up to 50 W from a reliable all-fiber, polarization-maintaining design. Integrated with an intuitive IoT-enabled control system and housed in a ruggedized 4U, 19" rack-mount chassis, purpose-built for demanding scientific and industrial environments.



Features

- Wavelength: 1064 nm
- High output power (50 W)
- High reliability with all-fiber design
- Narrow linewidth (<20 kHz)
- Excellent power stability (<1%)
- User-friendly interface via IoT technology
- 4U, 19" rack-mount chassis
- Certified to IEC 60825-1:2014 safety standards

Applications

- Laser cooling and trapping
- Atomic interferometry
- Quantum sensing
- Quantum computing
- Precision measurement

Single-Frequency Capability

QTekLaser™ amplifiers can be configured with various seed lasers depending on customer requirements—ranging from economical semiconductor diode lasers (MHz linewidth) to robust fiber lasers (kHz linewidth) or cavity-locked ultra-stable lasers (Hz linewidth). These selections can be integrated into the laser system as illustrated.

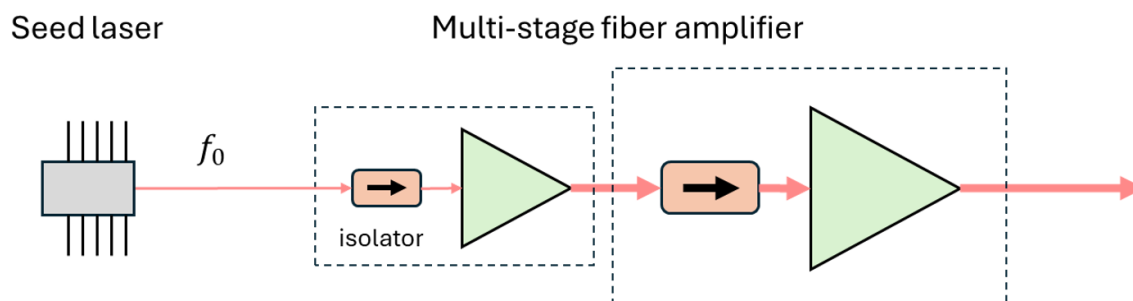


Figure 2 – Diagram showing a typical single-frequency QTekLaser™ fiber laser.

Specifications

Parameter	Value
Wavelength	1064 nm
Output Power	1–50 W
Polarization Extinction Ratio (PER)	30 dB
Power Stability	< 1%
Laser Linewidth	< 20 kHz
Operating Temperature	17–25 °C
Wavelength Tuning Range	> 20 pm
Cooling Mode	Water cooling
Beam Quality	TEM00, $M^2 < 1.05$
Output Mode	Free space, collimated; ~2 mm $1/e^2$ diameter
Relative Intensity Noise (RIN)	–135 dBc/Hz @ > 10 kHz
Side-Mode Suppression Ratio (SMSR)	59 dB
Laser Head Size	12" × 9" × 3.714"
Chassis	4U, 19" rack mount

Safety & Retro-Reflection Advisory

Complies with 21 CFR Subchapter J, Part 1040 (U.S. FDA) and IEC 60825-1:2014 standards.

End users must ensure that no significant light is retroreflected into the system, as this can degrade performance or damage the laser. The use of an external optical isolator is strongly recommended. Damage due to retroreflected light is not covered under warranty.



Ordering Information

Part Number: QT-SF-LASR-Yb-1064-50-W-2-2

Description: seed laser + Yb-doped fiber amplifier

Performance Figures & Graphical Data

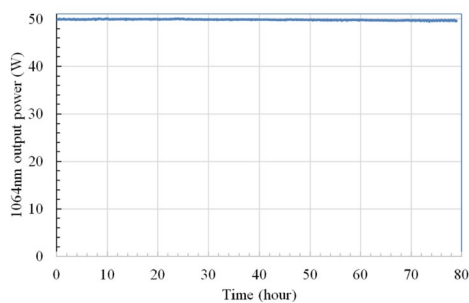


Figure 3 – Power Stability: <1%

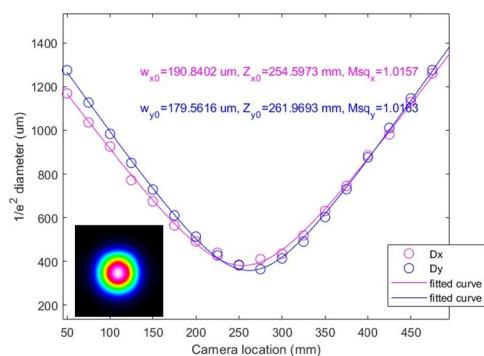


Figure 4 – Beam Quality: $M^2 < 1.05$

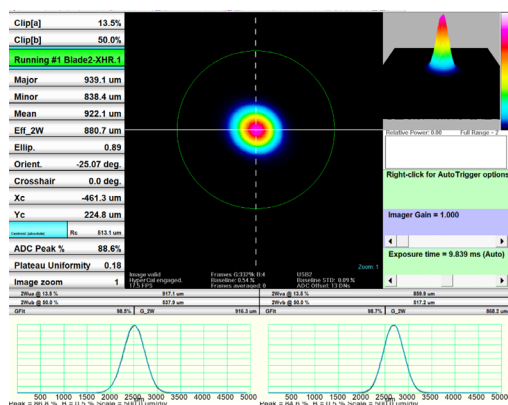


Figure 5 – Beam Profile: $1/e^2$ dia. 0.9 mm

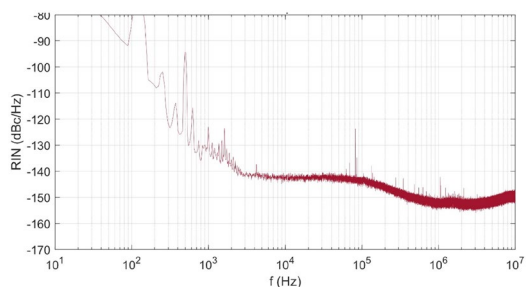


Figure 6 – Relative Intensity Noise (RIN):
<-140 dBc/Hz >10kHz

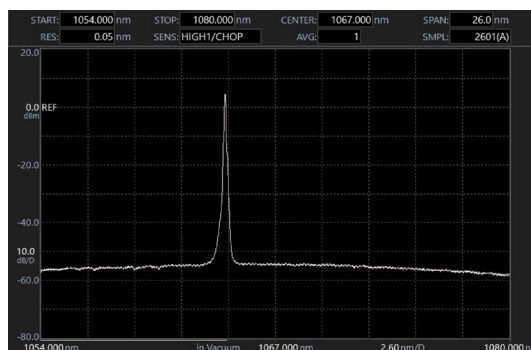


Figure 7 – Optical Spectrum: SMSR 59 dB

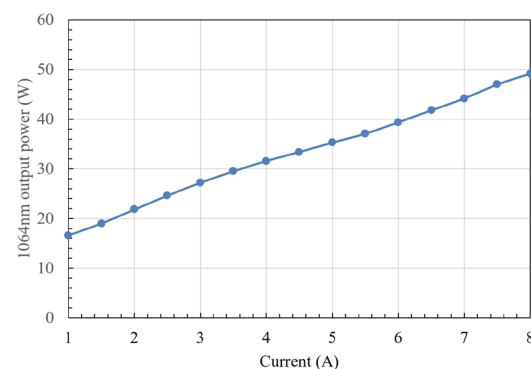


Figure 8 – Laser Power vs Current.

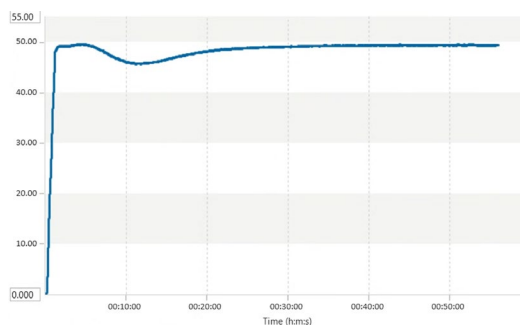


Figure 9 – Cold Start Power profile.

Mechanical Details

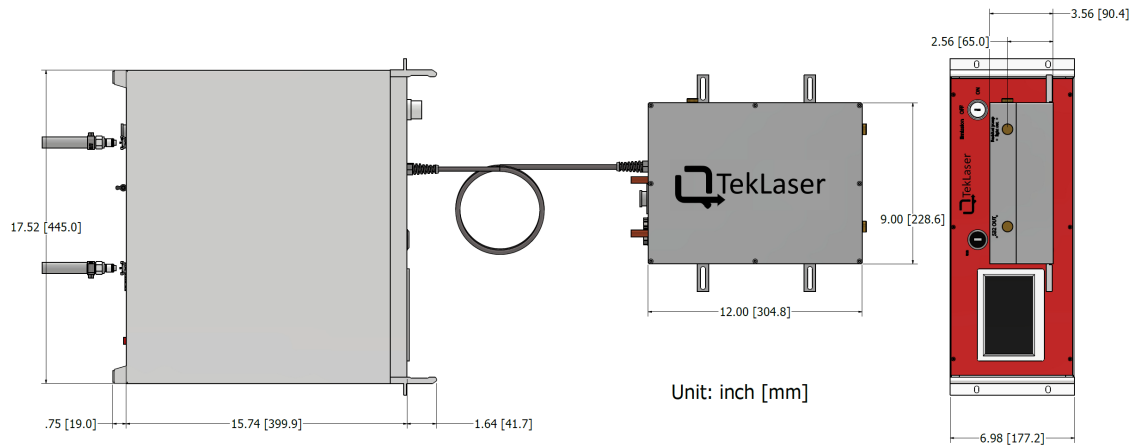


Figure 10 – Mechanical dimensions of the fiber-laser system.

Product Photographs



Figure 11 – Front view of the fiber laser in 4U chassis.



Figure 12 – Rear panel view of the 4U water-cooled chassis.