

QTekLaser™ 532 nm Fiber Laser

Product Description

The QTekLaser™ 532 nm Fiber Laser is a state-of-the-art green-wavelength laser optimized for both research and industrial precision. Leveraging robust second-harmonic generation (SHG) technology, it delivers ultra-stable, narrow-linewidth (<20 kHz), polarization-maintaining light with output powers up to 14 W. It offers excellent power stability (<1%) and incorporates a user-friendly, IoT-enabled interface. The compact, industrial-grade 4U, 19" rack-mount chassis ensures easy integration and deployment.



Features

- Wavelength: 532 nm
- High output power: up to 14 W
- High reliability with all-fiber design
- Narrow linewidth: <20 kHz
- Power stability: <1%
- IoT-enabled interface for intuitive control
- Compact 4U, 19" rack-mount chassis
- Certified to IEC 60825-1:2014 safety standards

Applications

- Laser cooling and trapping
- Atomic interferometry
- Quantum sensing
- Quantum computing
- Pumping Ti:Sapphire lasers
- Precision measurement
- Holography

Second-Harmonic Generation (SHG) Technology

QTekLaser™ offers laser systems with extended wavelength range by combining nonlinear frequency conversion technologies. Through second-harmonic generation (SHG) we achieve significant laser power at the visible and NIR regime (figure 2; red-shaded cells of table 1). With periodic poled crystal technology and the associated waveguide technology, nonlinear frequency conversion has become a powerful tool to extend the application scope of fiber lasers. The max power of the converted laser light is constrained by the damage threshold of commercially available nonlinear crystals, which is typically several tens of watts.

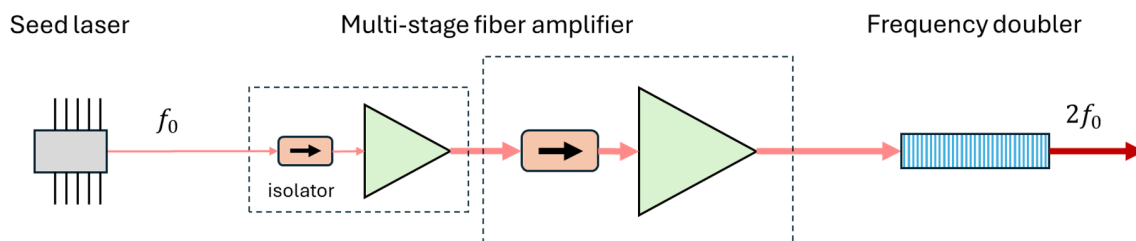


Figure 2 – Laser system with integrated frequency doubler.

Table 1 – Wavelength extension of QTekLaser™ products using nonlinear frequency conversion.

	SF-AMP-Yb (1012 – 1080 nm)	SF-AMP-Er (1530 – 1610 nm)	SF-AMP-Tm (1776 – 2040 nm)
SF-AMP-Yb (1012 – 1080 nm)	506 – 540 nm		
SF-AMP-Er (1530 – 1610 nm)	609 – 646 nm	765 – 805 nm	
SF-AMP-Tm (1776 – 2040 nm)	645 – 706 nm	822 – 900 nm	888 – 1020 nm

Specifications

Parameter	Value
Wavelength	532 nm
Output Power	1–14 W
Polarization Extinction Ratio (PER)	25 dB
Power Stability	< 1%
Laser Linewidth	< 20 kHz
Operating Temperature	17–25 °C
Wavelength Tuning Range	0.5 nm
Cooling Mode	Water cooling
Beam Quality	TEM ₀₀ ; M ² < 1.1
Output Mode	Free space, collimated; ~2.1–2.2 mm 1/e ² diameter
Relative Intensity Noise (RIN)	–135 dBc/Hz @ >10 kHz
Side-Mode Suppression Ratio (SMSR)	60 dB
Laser Head Size	12" × 12" × 3.714"
Chassis	4U, 19" rack mount

Safety & Retro-Reflection Advisory

The 532 nm laser system complies with 21 CFR Subchapter J, Part 1040 (as enforced by FDA) and IEC 60825-1:2014 safety standards.

Users must ensure that significant light is not retroreflected into the system—doing so may harm performance or damage the laser. Use of an external optical isolator is strongly recommended. Damage from retroreflected light is not covered under warranty.

Ordering Information

Part Number: QT-LASR-BSHG-532-14-W-2

Configuration: Seed laser + Yb-doped fiber amplifier + SHG stage

Performance Figures

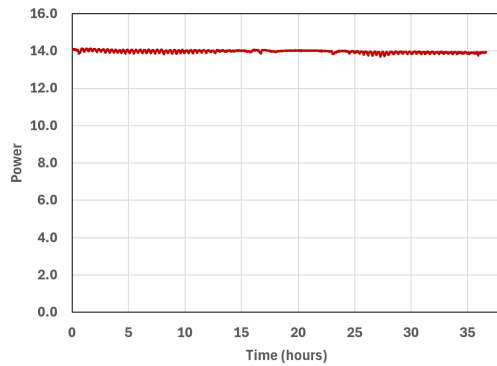


Figure 3 – Power Stability: <1%.

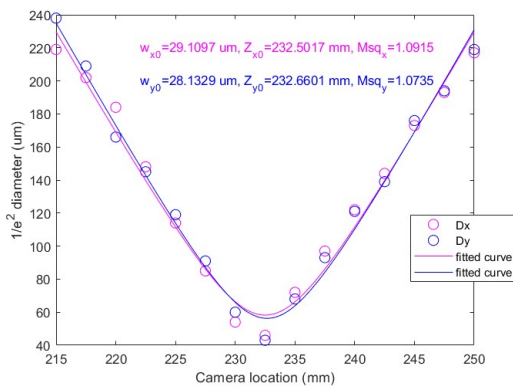


Figure 4 – Beam Quality: M² <1.1.

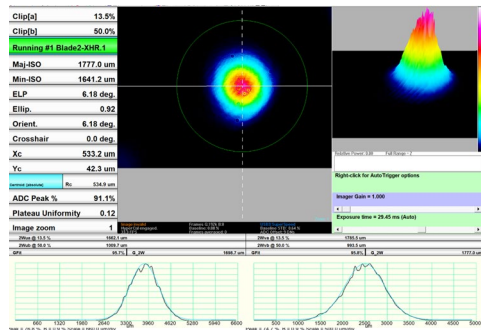


Figure 5 – Beam Profile.

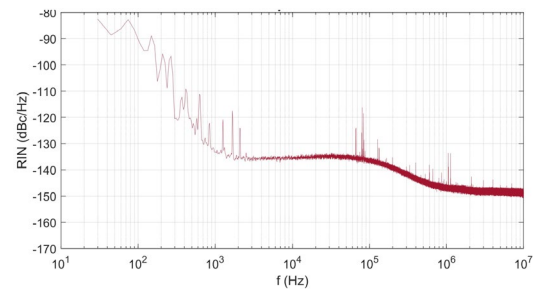


Figure 6 – Relative Intensity Noise (RIN):

<-135 dBc/Hz >10kHz

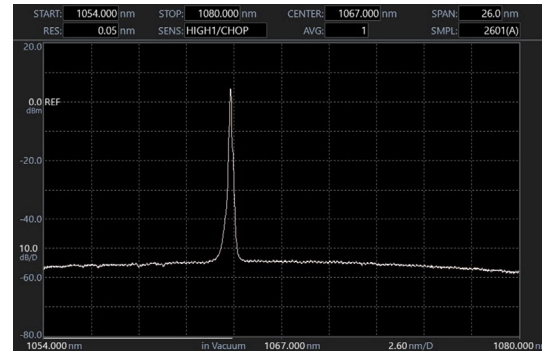


Figure 7 – Optical Spectrum: SMSR ~60 dB.

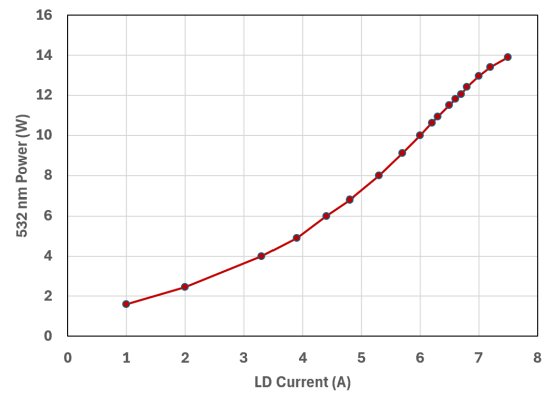


Figure 8 – Laser Power vs Current.

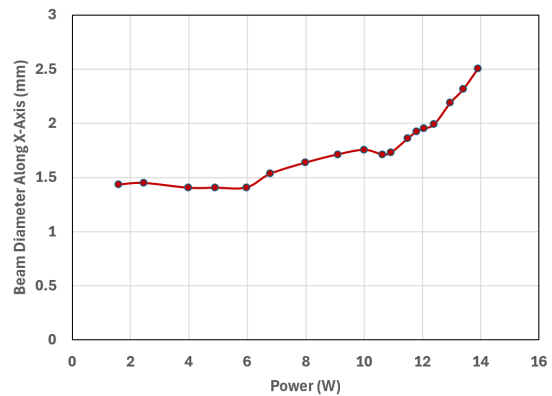


Figure 9 – Thermal Lensing Effect on beam size.

Mechanical Details

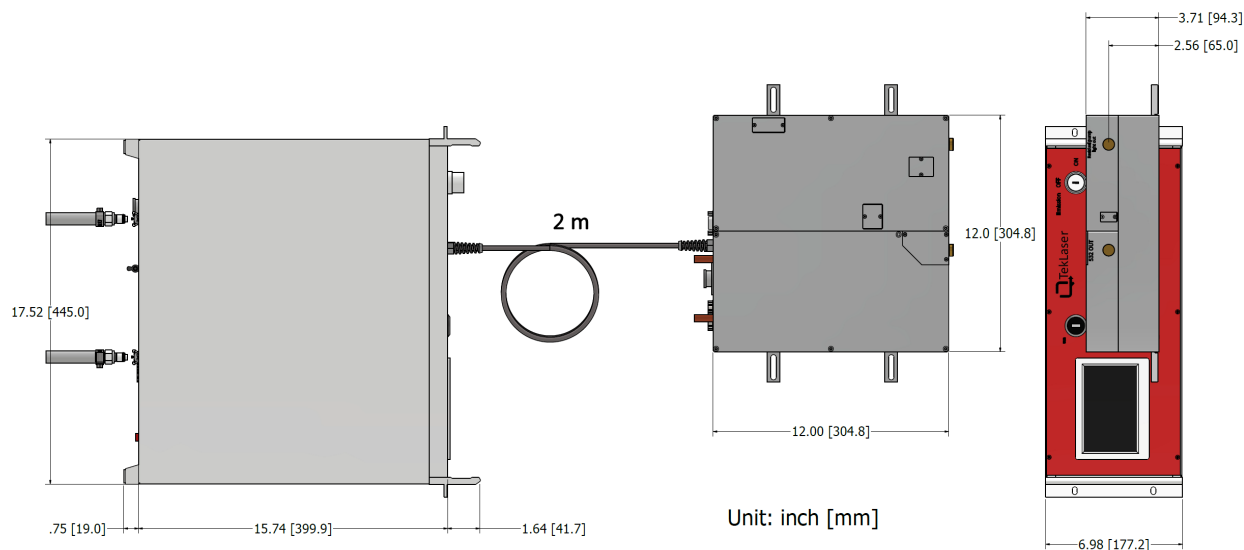


Figure 10 – Mechanical dimensions of the 532 nm fiber-laser system.

Product Photographs



Figure 11 – Front view of the 532 nm fiber laser in 4U chassis.



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



Figure 14 – Laser head.



Figure 15 – Front view of laser head.



Figure 16 – Rear view of laser head.