

# QTekLaser™ 1590 nm Fiber Laser

## Product Description

The **QTekLaser™ 1590 nm Fiber Laser** is a single-frequency, polarization-maintaining system delivering up to 10 W CW output over the 1580-1600 nm range. Housed in a rugged 19-inch 3U rack-mount chassis with an all-fiber, SBS-free design, it features narrow linewidth, excellent beam quality, high polarization extinction ratio, low thermal lensing, and power stability under 1%. Controlled via an IoT/TCP interface, it includes safety interlocks and complies with IEC 60825-1:2014. Ideal for demanding applications such as quantum computing and sensing, atomic interferometry, laser cooling/trapping, and precision research.



## Features

- Wavelength range: 1580-1600 nm
- High output power (10 W)
- High reliability with all-fiber design
- Narrow linewidth (<20 kHz)
- Excellent power stability (<1%)
- User-friendly interface via IoT technology
- 3U 19" rack-mount chassis + laser head
- Certified to IEC 60825-1:2014 safety standards

## Applications

- Quantum computing
- Quantum sensing
- Atomic interferometry
- Laser cooling and trapping
- Frequency doubling or mixing
- Research

## 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.

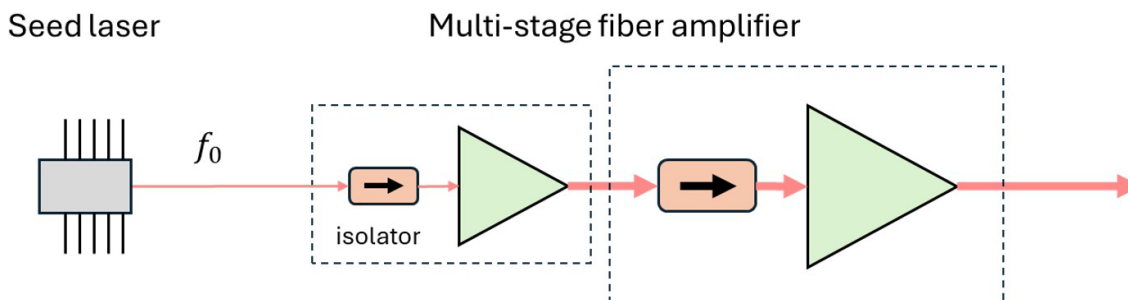


Figure 2 – Diagram showing a typical single-frequency QTekLaser™ fiber laser.

## Specifications

Parameter	Unit	Value
Wavelength range	nm	1580-1600
Operation mode	/	CW
Max output power	W	10
Laser linewidth	kHz	~20
Output type	/	Fiber to free space collimator
Output beam diameter (1/e <sup>2</sup> )	mm	1.5
Beam quality	M <sup>2</sup>	1.02
Beam divergence angle	mRad	1.4
Output isolation	dB	>30
Polarization direction	/	Horizontal
Polarization extinction ratio	dB	>35
Amplifier operation temperature	°C	15 – 32
Cooling	/	Forced Air
Remote interlock voltage	V	3.3
Max power consumption	W	195
AC power supply voltage	V	110
Fuse	/	6A, 250VAC, 5X20mm
Chassis operation temperature	°C	15 – 40
Room temperature	°C	15 – 23
Room humidity	%	30 – 50
Warm-up time	min	~30
Weight	lbs	39
Dimension	/	3U
Communication Interface	/	IoT, TCP
RIN peak frequency	/	<-125dBc/HZ @ >10kHz

## 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-1590-10-2-2-1

Laser Type: seed laser + Er-doped fiber amp

## Performance Figures

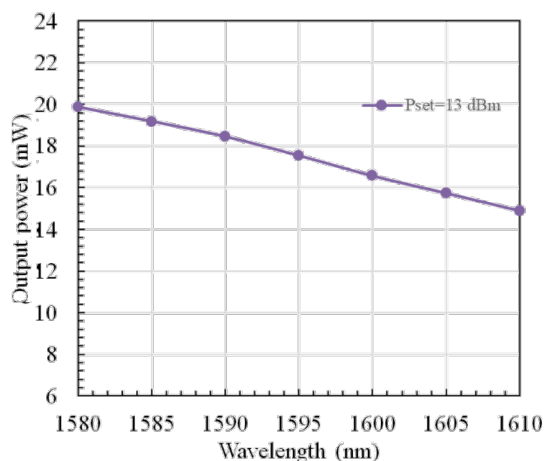


Figure 2. Output power of L-band tunable seed laser, set power is 13 dBm.

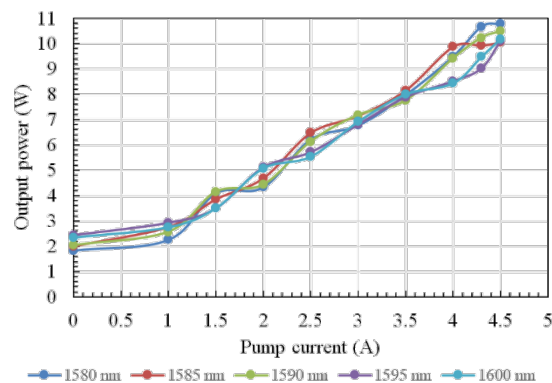


Figure 3. Output power vs. current for various wavelengths where the seed set power is 13 dBm.

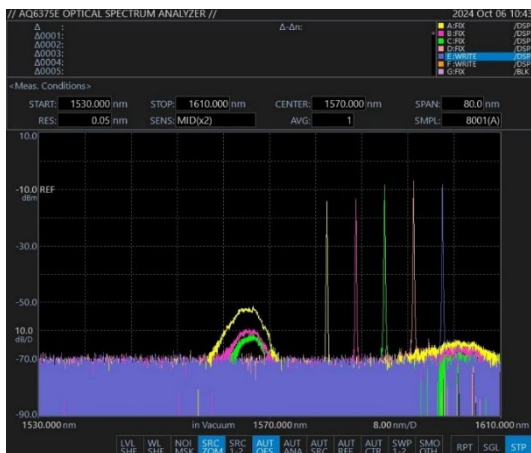


Figure 4. Optical spectrum at different wavelengths.

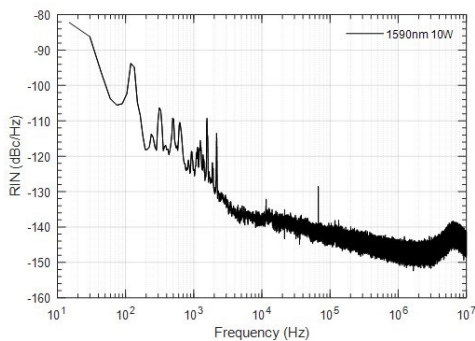


Figure 5. Relative Intensity Noise (RIN): 1590 nm <-135 dBc/Hz >10kHz.

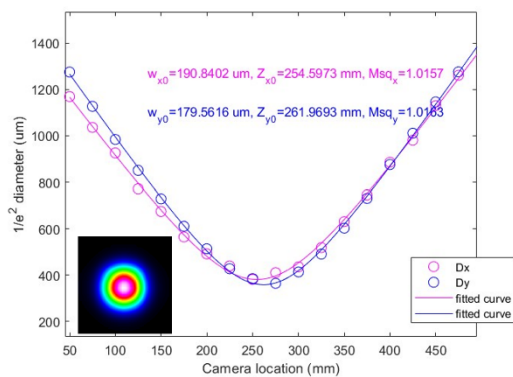


Figure 6.  $M^2 < 1.02$ .

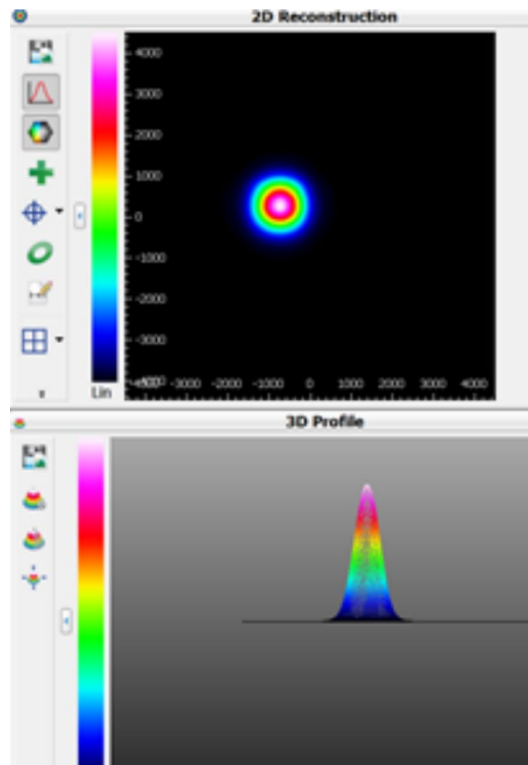


Figure 8. Beam profile.

## Mechanical Details

Unit: inch [mm]

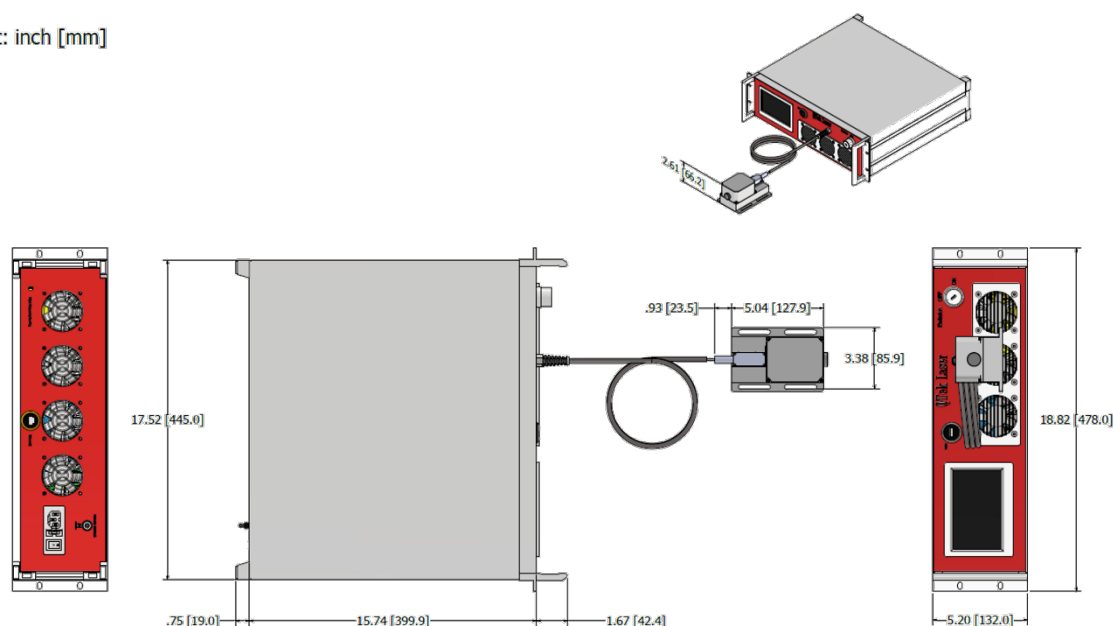


Figure 8. Mechanical dimensions of the fiber-laser system.

## Product Photos



Figure 9. 1590 nm fiber laser.



Figure 10. 1590 nm fiber laser back panel.