

High Power 780 nm Fiber Based Femtosecond Laser



Applications

- Multiphoton microscopy
- Biophotonics
- Materials characterization
- Optical metrology
- Terahertz radiation

Features

- Ultra compact laser head
- Excellent beam pointing stability
- High power stability
- Air cooled – no chiller required
- Optional wavelength 1550 nm output
- Pulse widths < 80 fs with negligible pulse pedestal
- RF synchronization output
- Low power consumption
- Field proven product reliability

The Carmel CFL-05RFF0 is a high power, 780 nm, fiber based femtosecond laser. Its ultra compact laser head is about 300 times smaller than many Ti:Sapphire lasers with a similar output power level. It is a turnkey, rugged industrial laser system with a portable design and excellent system stability. Push button startup and no maintenance makes our fiber lasers easy to use and hassle free. The CFL series offers user-friendly front panel control knobs for flexible system adjustment. The pulse width is less than 80 fs with a negligible pedestal. The repetition rate can be specified from 10 to 80 MHz with a polarization-maintaining (PM) output and excellent beam quality, with an $M^2 < 1.2$. An RF synchronization output is provided as a trigger signal. A system with both of 780 nm and 1550 nm outputs is available. User can manually switch between two wavelengths.

For multiphoton spectroscopy applications, the Carmel offers ideal performance to optimally image tissue with less scatter and lowered risk of tissue damage. The compact size and fiber delivery simplifies implementation by eliminating costly redesign of delivery optics and by easily integrating within existing microscopes.

Calmar's CFL operation is based upon the company's proprietary passive mode-locking technology, which ensures reliable startup and stable long term performance. Carmel high power, fiber based femtosecond lasers enable end users to focus on the job at hand, and not the laser tool being used.

Technical Specifications

| OPTICAL | | |
|--|---|-----------------|
| Wavelength (nm) | 780 | 1550 (optional) |
| Average Power (W) | Up to 0.8 | Up to 2.5 |
| Pulse Width ¹ (fs) | < 80* | < 100 |
| Pulse Energy (nJ) | 10* | 50 |
| Beam Quality | $M^2 < 1.2$ | $M^2 < 1.1$ |
| Beam Diameter (mm, $1/e^2$) | 1.0 typical | |
| Beam Roundness (%) | > 90 | |
| Spectral Width (nm) | ~ 10 | ~ 40 |
| Nominal Pulse Repetition Rate ² (MHz) | 10 - 80 (a single rate) | |
| Polarization Extinction Ratio (dB) | > 25 | > 18 |
| Power Stability in Operating Temperature Range | < 1% (RMS) | |
| Termination | Free space, collimated beam | |
| ELECTRICAL | | |
| Supply Voltage (VAC) | 85 ~ 264 autoranging | |
| Supply Frequency (Hz) | 47 ~ 63 autoranging | |
| Power (VA) | 200 | |
| RF Synchronization Output | 0.5 V, with SMA connector | |
| MECHANICAL | | |
| Warm up time | 10 minutes (typ) | |
| Operating Temperature (°C) | 17 - 35 | |
| Storage Temperature (°C) | 0 - 50 | |
| Connection between controller and head (cm) | Armored fiber cable connection between laser head and controller with length 1-5 meters | |
| Laser Head Dimensions (cm) | 9.0(w) x 13.0(d) x 3.0(h) | |
| Laser Controller Dimensions (cm) | 44(w) x 42(d) x 9(h); 2U 19" rackmount | |
| Cooling | Air cool with low noise fan | |

¹ A $sech^2$ pulse shape (convolution factor of 0.65) is used to determine the pulse width from the second harmonic autocorrelation trace. Due to continuous improvement, all product specifications are subject to change without prior notice.

² Other nominal repetition rate can be factory-configured, may affect other specifications

* Customized shorter pulse width and higher pulse energy are available.

