



Beyond Photonics has keen interest in laser and lidar product development, as relevant markets mature and expand. Over the years our team members have taken numerous photonic concepts from the earliest stages of development to hardened products for use in demanding operating environments, including harsh airborne applications. Below you can explore a couple of products that we expect to follow with more extensive offerings in the near future.

Cool Cards

The CoolCard is a simple, easy-to-use laser beam display and “on-the-fly” evaluation technology available specifically for use with the ever-expanding field of eye-safe mid- and far-infrared laser sources, beyond the reach of competing technologies. Optimized for basic location and quick spatial-mode structure evaluation of IR beams in complex optical systems, the CoolCard™ II Laser Beamfinder is small, lightweight, and requires no low-light requirements or photonic “re-charging” like chemical phosphor cards do. Featuring the same great performance as its predecessor, the CoolCard™ II now features fast-rechargeable Li-Ion battery operation for more flexibility in the lab or the field (where AC power may not be easily available). The CoolCard™ II is hand-held, or can be post-mounted in two different orientations for “hands-free” use on the optical tabletop. The CoolCard is appropriate for use with:

- CO2 lasers
- Holmium and Thulium Lasers
- IR Diodes (e.g., Quantum Cascade Diode Lasers)
- Far-IR, Terahertz sources
- Nonlinear Sources (OPOs, OPAs)

Cool Cards

Characteristics include:

- Sensitive (3 mW/cm²), high spatial resolution display uses precision temperature stabilized liquid crystal
- Sharper spatial resolution and greater wavelength range (0.8 μm-Far IR) compared to orange phosphor or cumbersome UV-charged passive cards
- 30 W/cm² damage threshold—simple and inexpensive liquid crystal sensor replacement if damage does occur
- Lightweight, hand-held design; post-mountable in “portrait” & “landscape” orientations for hands-free use
- Same performance as our original CoolCard™, but with enhanced flexibility for lab, factory floor, or field use



SWIFT CW FREQUENCY-TUNABLE SINGLE-FREQUENCY LASER

The Swift is a compact, single-frequency, eye-safe diode-pumped laser optimized for use in coherent and direct detection lidar systems. Exhibiting high output power and < 10 kHz/ms short-term frequency jitter, the Swift is ideal for use as a master and local oscillator source in coherent lidar systems. Very fast and broad mode-hop-free frequency tuning enables next-generation spectroscopic applications like pollution monitoring and greenhouse gas measurements using differential absorption lidar techniques. The Swift laser product is initially offered using Tm,Ho:YLF operating across 2047-2059 nm wavelengths with multi-tens of GHz single-frequency tuning using an integral piezo actuator. Single-frequency output powers in excess of 100 mW are now available. The Swift capitalizes on Beyond Photonics' decades of experience in the development and perfection of extremely stable single-frequency lasers. Other possible wavelengths include 1.06, 1.32, 1.5, 1.617, 1.645, 2.02, and 2.09 micron, with multi-nm set-ability across each central wavelength case. Please inquire about other wavelengths not listed.

SWIFT CW FREQUENCY-TUNABLE SINGLE-FREQUENCY LASER

Tm,Ho:YLF Swift Specifications

- 2047-2059 nm factory-set peak wavelength; mode-hop-free user-tunable ± 0.14 nm/ ± 10 GHz with integral PZT tuning; tunable ± 0.20 nm/ ± 29 GHz with combination of PZT and thermal tuning
- Integral 60 dB Faraday isolation and single-mode PM fiber coupling standard
- CW single-frequency output power in excess of 30 mW; greater than 100 mW available as an option.
- Very compact sealed laser head: 1.2" W x 2.8" L x 1" H; conduction-cooled design
- Compact digital controller: 9" W x 7" D x 4" H; user-controlled via PC/GUI.
- Fast piezo single-frequency tuning (> 20 GHz); also capable of being thermally tuned. Larger piezo tuning range available on request.
- Linewidth less than 10 kHz/ms (dependent on piezo drive characteristics).
- Long-term frequency drift less than 1 GHz/day. Inquire about improved linewidth and long-term frequency stability via actively locking to an external reference.
- Linearly polarized output ($> 100:1$)
- Power requirements: 110 VAC, 60 Hz. Single 2 m long cable from laser head to compact table-top controller. Other OEM controller formats available on request.

