Diode Lasers Used in Defense Applications

The diode laser, by virtue of its breadth of power and wavelength offerings, configurability, modularity, compactness, high-efficiency and ability to operate under harsh environmental conditions lends itself very well to the demanding requirements of defense applications.

Coherent | DILAS offers products for defense applications in a wide selection of configurations from 405 nm to 2300 nm, including single bars, stacked arrays (vertical and horizontal) fiber-coupled modules with power scaling capabilities as well as wavelength locking options.
Applications

- Directed Energy
- Diode-Pumped Alkali Laser
- Illumination
- Infrared Countermeasures
- Range Finding
- Target Designation

Directed Energy and Laser Pumping

- Water-cooled stacks at 808, 880, 940, 976 nm
- Two-dimensional arrangement (n x m)
- Proven scalability within a stack
- Up to 200+W CW per bar
- Low smile for improved beam quality

Diode-Pumped Alkali Lasers (DPAL)

- 670 nm (Li), 766 nm (K), 780 nm (Rb), 852 nm (Cs)
- Wavelength locking
- Spectral line narrowing
- Highest CW power per bar
- Low smile
- Both axis collimated

Target Designation, Illumination, Infrared Countermeasure (IRCM) and Range Finding

- High peak power stacks
- Up to 500W peak at 940 nm or 980 nm per bar
- KW peak power QCW operation
- High temperature operation
- Vertical bar-to-bar pitch: 330 μm and higher
- Multi-color (rainbow) stacks

>1 μm Wavelengths for Direct Illumination and Gated Imaging

- 640 nm to 1938 nm
- Multi-wavelength modules
- Fiber-coupled unit with up to three individually addressable wavelengths
- CW and QCW operation

Bar based Modules for Fiber Laser Pumping

- Fiber-coupled module, Ø 200 μm, NA 0.22, based on DILAS’ tailored mini-bar architecture
- 976 nm conduction-cooled
- Electro-optical circuit board concept for compact arrangement
- Optimized mini-bar design enabling efficient beam shaping
- Automated chip mounting
- Automated active alignment and mounting of beam shaping micro optics
- Wavelength locking and spectral line narrowing
- Integrated back-reflection filter
- Up to 1000W at Ø 200 μm, NA 0.22 cladding-free
- Lightweight options

Single Emitter based Modules for Fiber Laser Pumping

- Fiber-coupled modules (Ø 106.5 μm)
- 9W at 793 nm
- 30W at 976 nm
- 50W to 150W at 976 nm
- Non-detachable fiber pigtail
- Conduction-cooled
- Compact size
- High temperature operation
- <1 nm linewidth option
- Developed for Thulium and Ytterbium fiber laser pumping applications, requiring high speed modulation rates in the kHz regime

DI-102017

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