



High Coherent Power, Two-Dimensional Surface-Emitting Semiconductor Diode Array Laser

[View U.S. Patent No. 7,457,340 in PDF format.](#)

WARF: P05334US

Inventors: Dan Botez

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a semiconductor laser that provides seven times the power previously seen from surface-emitting semiconductor lasers.

Overview

A UW-Madison researcher previously described a high-power, single-mode, two-dimensional, semiconductor diode laser formed on a substrate with an anti-guided array of laterally spaced grating surface emitters (see WARF reference number P02180US). However, scaling that device to include longer arrays reduces device efficiency and output power due to a destructive interference effect inherent in devices with long gratings of constant periodicity.

The Invention

The UW-Madison researcher has now developed a semiconductor laser that uses a variable periodicity, or chirped, grating. The grating works with the previous device to prevent the laser emissions from canceling each other out. The grating structure ensures single longitudinal-mode operation and can also be formed to act as a highly efficient selector of the in-phase array mode.

Applications

- Non-invasive medical diagnostics
- Biotechnology
- Laser projection systems
- Optical communications

Key Benefits

- Provides seven times the power previously seen from surface-emitting semiconductor lasers
- Enables CW watt-range, stable, single-mode laser light sources
- Single frequency makes it ideally suited for power scalability via frequency multiplexing in external beam-combining configurations
- Simplified packaging as compared to edge-emitting devices
- Capable of providing tens of watts of power for applications such as high-efficiency, high-resolution magnetic resonance imaging (MRI) with noble gases

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For More Information About the Inventors

- [Dan Botez](#)

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Related Technologies

- [See WARF reference number P02180US for the inventor's previous laser.](#)

Tech Fields

- [Analytical Instrumentation, Methods & Materials : Lasers](#)

For current licensing status, please contact Michael Carey at mcarey@warf.org or 608-960-9867

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