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

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WARF: PO2180US
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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a two-dimensional, surface-emitting, semiconductor diode laser capable of two to three watts of output power during single-mode, single-frequency operation, and tens of watts of coherent power when scaled at the wafer level.

OVERVIEW

Second order, surface-emitting, distributed feedback (DFB) lasers possess a number of attractive features, including dynamic single-mode operation, high output power and compatibility with other optical components.

THE INVENTION

A UW-Madison researcher has combined second order DFB and distributed Bragg reflector (DBR) grating structures with a phase-locked, anti-guided array to result in a two-dimensional, surface-emitting, semiconductor diode laser capable of two to three watts of output power during single-mode, single-frequency operation, and tens of watts of coherent power when scaled at the wafer level. The grating provides both feedback and light out-coupling, selects the desired in-phase array mode and can be designed to double the array-emitting aperture (from 100 to 200 microns) for increased power. The combination of anti-guided arrays with gratings also allows for scaling at the wafer level.

APPLICATIONS

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

KEY BENEFITS

- Delivers watts of coherent power from large apertures (200 by 1200 microns)
• Provides a high-power diode laser for biotechnology applications
• When applied to mid-infrared diode lasers, this technology could greatly increase the sensitivity of non-invasive medical diagnostics, as well as sensors for chemical and biological agents
• Provides high-power in both single spatial and single frequency modes

ADDITIONAL INFORMATION

Tech Fields
Analytical Instrumentation - Lasers

CONTACT INFORMATION

For current licensing status, please contact Jeanine Burmania at jeanine@warf.org or 608-960-9846.