29 January 2025

BluGlass showcases new product capability for quantum applications at Photonics West, files three US patents

Highlights

- Publishes advanced high-performance GaN DFB laser results in a technical paper presented at leading international conference, SPIE Photonics West, in San Francisco
  - Demonstrates break-through performance of integrated master oscillator and power amplifier (MOPA), achieving 750 mW of power in a single spatial mode
- Showcases advanced GaN laser capabilities in wafer-scale processing necessary for quantum applications in sensing, communication, navigation, and computing applications.
- Files three new US provisional patent applications for novel high power, tunable gallium nitride (GaN) lasers designed to address key requirements for quantum, aerospace, and biotech applications

Global semiconductor developer, BluGlass Limited, pioneering advanced visible lasers for the quantum, defence, and biotech markets has filed three US patent applications (provisional patents) for next-generation high-power, tunable gallium nitride (GaN) lasers, and published its advanced results in a technical paper presented at leading international conference, SPIE Photonics West.

The Company has demonstrated novel capabilities and device architectures designed to address key application challenges and enhance power and versatility of visible GaN lasers where power, precision, and tunability are required.

The Company has filed three US provisional patents around BluGlass' novel high-peak power continuous wave tunable GaN lasers for use in three critical markets:

- aerospace, marine, and defence applications
- quantum computing and quantum sensing applications
- biomedical and biotech applications.

Senior Product Developer, Dr. Ryan Anderson is presenting a technical paper, entitled "*Advancements in GaN DFBs with embedded gratings and a path to higher power on BluGlass' advanced GaN DFB development and a path to high-power ultra-precision applications*." Ultra-precision, near-single-frequency DFB lasers offer benefits for emerging technologies, delivering precise and stable performance essential for applications such as quantum sensing, navigation, communication, and next-generation defence and aviation. BluGlass' GaN DFBs are being designed for wafer-scale fabrication to reduce downstream optical alignment costs, and address critical challenges in quantum technologies and computing while enabling greater production volume and smaller device sizes.

BluGlass' technical paper highlights the improved performance of its GaN DFB lasers, demonstrating near single frequency emission from violet to aqua-marine, demonstrating side-mode-suppression ratios of greater than 40 decibels (dB), and peak full-width-half-maximum linewidths of under 3 picometers (pM).

The paper also showcases recent breakthrough results, demonstrating narrow-band high-power DFB sources, and initial results of semiconductor optical amplifiers (SOA) gain chips. Additionally, the paper highlights that BluGlass has successfully demonstrated an integrated GaN master oscillator power amplifier (MOPA), which achieved 750 mW power in a single spatial mode. The integrated device replaces a single-mode laser with fast and slow-axis lenses aligned to a semiconductor optical amplifier, increasing power while reducing size, and complexity.

BluGlass CEO Jim Haden said, "Our leading advances in visible GaN lasers, single-mode, near-single frequency, MOPA, and photonic integrated solutions are the key first steps in revolutionizing industries, including aerospace, defence, quantum computing, and biomedical applications. BluGlass is extending the bounds of visible laser capabilities, and the addition of DFB wavelengths from violet to aquamarine, world-class suppression of noise, and the integration of a single mode laser with a power amplifier achieving 750 mW of blue light in a single spatial mode are testaments to the incredible innovation pioneered by our world-leading team.

"Our growing strategic capability uniquely positions BluGlass to capitalise on the exciting growth markets of quantum sensing, communication, and computing. These advances will enable our customers to solve complex problems such as atmospheric LiDAR detection of clear air turbulence, underwater communications and LiDAR, and GPS spoofing and jamming by creating localised quantum solutions.

"I'm incredibly proud of our talented BluGlass team who continue to advance our novel capabilities and produce breakthrough results. GaN DFB lasers have unrivalled advantages in cost and scale that will create new opportunities in quantum sensing and quantum computing. These advantages, in turn, will enable innovation, enhance safety in commercial and defence aviation, expand biomedical and health technology, autonomous vehicles, drones, and advanced positioning systems."

The Company is exhibiting at the 2025 SPIE Photonics West Conference in San Franciso from 28-30 January, showcasing its advanced DFB and MOPA designs, and improved performance of its Fabry Perot lasers. Customers and partners are invited to visit the BluGlass booth #4647 at the conference.

BluGlass' DFB development partner University of California, Santa Barbara (UCSB) is also presenting a paper on the joint GaN DFB laser development, showcasing world-leading narrow linewidths and their potential applications. The research features joint BluGlass and UCSB performance data and was co-authored by BluGlass Senior Laser Scientist Ryan Anderson.

For more information, please contact:

Stefanie Winwood | +61 2 9334 2300 | swinwood@bluglass.com

About BluGlass

BluGlass Limited (ASX:BLG) is a leading supplier of GaN laser diode products to the global photonics industry, focused on the industrial, defence, bio-medical, and scientific markets.

Listed on the ASX, BluGlass is one of just a handful of end-to-end GaN laser manufacturers globally. Its operations in Australia and the US offer cutting-edge, custom laser diode development and manufacturing, from small-batch custom lasers to medium and high-volume off-the-shelf products.

Its proprietary low temperature, low hydrogen, remote plasma chemical vapour deposition (RPCVD) manufacturing technology and novel device architectures are internationally recognised, and provide the potential to create brighter, better performing lasers to power the devices of tomorrow.