

2023 ANNUAL GENERAL MEETING

BluGlass Limited (ASX:BLG), 9 October 2023

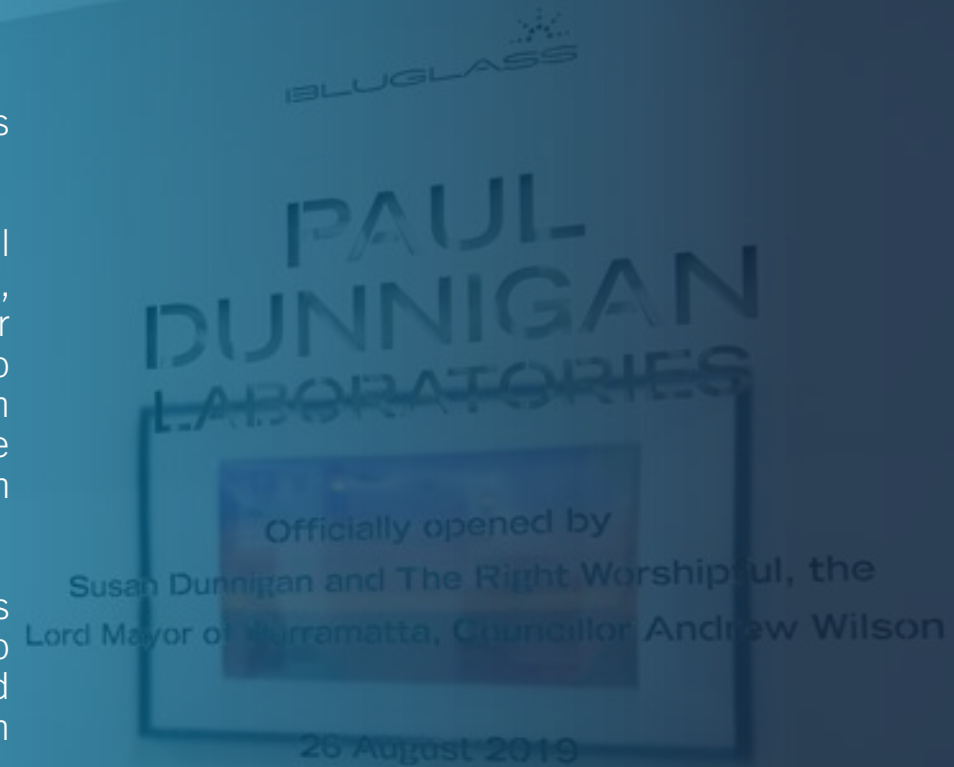
FORWARD LOOKING STATEMENT

This document has been prepared by BluGlass Limited to provide readers with an update of the Company and the Company's technology.

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Information on Service Addressable Markets (SAM) is based on internal BluGlass modelling and assumptions, both of which depend on successful R&D outcomes and results achieved within estimated timetables. BluGlass recommends a cautious interpretation be taken by investors.



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JAMES WALKER CHAIR'S REPORT

ACCELERATING PROGRESS IN FY23



FINANCIAL PERFORMANCE

	2023	2022	YoY Movement
	\$	\$	%
Revenue	1,146,235	604,749	Up 90%
Other Income	8,368,678	3,661,282	Up 129%
Net Assets	13,887,160	13,220,332	Up 5%
Consolidated Loss	11,751,243	9,355,554	Up 20%
R&D Tax Rebate (Receipt for prior year R&D spend)	~7,300,000	4,050,000	~Up 81%
Cash Position (as at end of FY)	4,258,334	5,351,589	Down 20%



LAYING THE FOUNDATIONS FOR OUR FUTURE SUCCESS



Launched suite of GaN visible laser diodes

Products available in underserved wavelengths and flexible form factors to address key customer challenges.



Multiple customer orders

Initial orders from leading industrial and quantum OEMs, an international energy research institute, and medical device manufacturers. Revenue capacity of US\$170M.



Proprietary technology; 56 patents

RPCVD manufacturing process enables novel, brighter and higher efficiency laser diodes.



Few competitors in rapidly growing US\$2.5B market

One of just a handful of GaN laser manufacturers globally, with high barriers to entry. BluGlass is a pure-play GaN laser supplier



Expert laser and manufacturing team

Highly experienced manufacturing team, led by laser diode veteran Jim Haden.



Global operations

Vertically integrated across three production facilities:

- Sydney, NSW, Australia
- Silicon Valley, California, USA
- Nashua, New Hampshire, USA

ASX: BLG





JIM HADEN CEO'S REPORT

WHO WE ARE: LEADING PURE PLAY GaN LASER SUPPLIER

BluGlass is one of only a handful of global GaN laser suppliers, with rapidly growing demand and high-barriers to entry

WAVELENGTHS

Visible GaN lasers are an emerging technology that is disrupting advanced industries and enabling new markets due to quantum leap in performance and precision

400 nm

405 nm

420 nm

450 nm

488 nm

500 nm

525 nm

INDUSTRIAL

DEFENSE

SCIENTIFIC

BIOTECH

DISPLAY

APPLICATIONS

MARKET OVERVIEW

At a Glance



Lasers are a ubiquitous technology underpinning global advanced technology trends



GaN lasers are the fastest growing market segment, displacing traditional IR lasers and opening new markets



The GaN laser systems market is projected to reach US \$2.5B by 2025 up from \$1B today



GaN provide a quantum step in performance over traditional Infrared lasers

GLOBAL MEGATRENDS DRIVING ADVANCED LASER APPLICATIONS

- Electric vehicles
- Autonomous vehicles
- Drones
- Computing & semiconductors
- Energy Storage
- Sensing

**Electrification
&
Digitalization**

**Industry
4.0**

- Smart manufacturing
- 3D printing
- Materials processing
- Automation
- Robotics
- Machine vision
- Artificial Intelligence

Quantum

- Quantum sensing
- Quantum computing
- Quantum Simulation
- Cryptography

Metaverse

- Augmented reality (AR)
- Virtual reality (VR)
- Mixed reality (MR)

**Healthcare
- BioTech**

- Wearables - Sensing
- Flow cytometry
- DNA Next Gen-Sequencing
- Optical coherence tomography
- Optical magnetic field sensing
- Viral and Bacterial mitigation

**Defense &
Space**

**Laser technology
underpins global
megatrends**

GaN LASER MARKET VERTICALS (2025)

Industrial



(405nm, 450nm, 525nm)

US \$400M

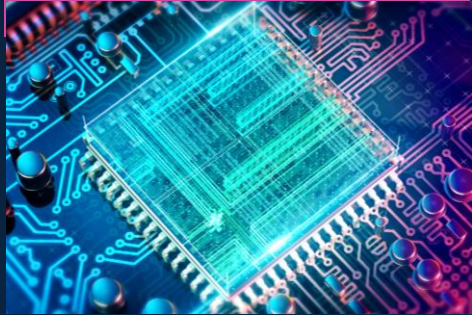
Applications:

Materials processing, Machine vision & sensing, 3D printing, Semiconductors

OEM Customer Landscape:

IPG Photonics, nLight, NUBURU, Coherent

Quantum & Scientific



(405nm, 420nm, 450nm, 488nm, 525nm)

US \$100M

Applications:

Quantum computing, Quantum sensing & navigation, fluorescence microscopy

OEM Customer Landscape:

Coherent, Toptica, AOSense, Modulight

Biotech/Life Sciences



(405nm, 420nm, 450nm, 488, 525nm)

US \$60M

Applications:

Flow cytometry, Next-Gen DNA Sequencing, Photodynamic therapy

OEM Customer Landscape:

10X Genomics, Pac Bio, Lumencor, Element Biosciences

Display (AR/VR)



(450nm, 525nm)

US \$60M

Applications:

Augmented reality, Virtual Reality & Mixed Reality, Pico projectors, Heads-up display

OEM Customer Landscape:

Apple, Google, META, Samsung

Defense & R&D



(405nm, 420nm, 450nm, 488nm, 525nm)

US \$115M

Applications:

Navigation & guidance systems, Detection & sensing, Advanced materials processing

OEM Customer Landscape:

DARPA, Lockheed Martin, Northrup Grumman, Boeing

Source: Strategies Unlimited and Internal BluGlass modelling based on industry sources

KEY INDUSTRY PLAYERS BY SEGMENT



INDUSTRIAL

COHERENT

NUBURU

TRUMPF

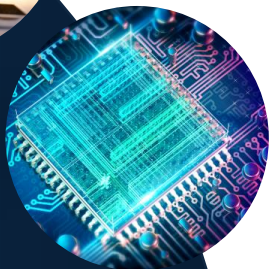
I P G
PHOTONICS

MITSUBISHI
ELECTRIC

AIRBUS

TERADIODE
NEXT GENERATION INDUSTRIAL LASERS

nLIGHT



QUANTUM & SCIENTIFIC

BOSCH

TOPTICA
PHOTONICS

IPS
Innovative Photonic Solutions

Fraunhofer

Laser
QUANTUM
INNOVATIVE RELIABLE INTELLIGENT



DISPLAY (AR/VR)



Google

G

Panasonic

LG

Meta

SAMSUNG



BIOTECH

modulight

BIOLASE
Advancing Dentistry™

Alcon®

IRIDEX



DEFENCE



DARPA

LOCKHEED MARTIN

Raytheon
Technologies

NORTHROP
GRUMMAN

BOEING

HIGHLY CONSTRAINED MARKET:

The GaN laser diode industry is an emerging market growing rapidly.



Challenged by constrained supply

Only a handful of captive global GaN laser suppliers in an emerging market with combined GaN laser systems revenue in excess of \$1B and set to grow to \$2.5B in 2025



Competitors are largely focused on LEDs

Most competitors are not dedicated GaN laser suppliers; they are captive in larger organizations with large differentiated product portfolios focused on LED and micro-LED markets



Low mix/high volume business models

Limited form factor flexibility, customisation and manufacturing agility in current business models is creating significant unmet needs in quantum, scientific defence, and biotech verticals



High barriers to market entry

BLG IS SOLVING CUSTOMER CHALLENGES



Manufacturing flexibility

BluGlass' laser offering addresses underserved markets, wavelengths and delivered in flexible form factors.



Dedicated GaN laser supplier

A dedicated GaN laser supplier targeting the industrial, scientific, biotech, defence and display markets.



Differentiated offering

Proprietary Remote Plasma Chemical Vapour Deposition (RPCVD) platform and Tunnel Junction technology provide competitive advantages, enabling brighter and better performing lasers.



Development capability

Supporting customer product roadmaps with development capability to power innovative new applications.




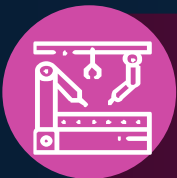



The world's easiest to use GaN laser light

Packaging and customisation flexibility to reduce customer integration costs, solving key challenges.

MARKET DRIVERS - THE ADVANTAGES OF GaN LASER DIODES

Visible GaN laser diodes have many advantages over traditional infrared lasers

-  Visible light has higher absorption in key industrial metals
-  Cleaner, faster welding, 3D-printing, and materials processing
-  Tighter beam focus and improved efficiency
-  Higher precision manufacturing, enabling increasingly advanced technology applications
-  Visible and UV light interacts favorably with quantum and organic materials (viruses, bacteria, cancer cells)

Key Metals	Improvement of energy absorption in metals
Gold	66x
Silver	17x
Copper	13x
Aluminum	3x
Nickel	1.5x
Steel	1.5x

Source: NASA, 1969

TECHNOLOGY AND CUSTOMER ENGAGEMENT

At a Glance



We've established our core technology



Adding functionality increases customer value and results in higher average selling price (ASP)



We introduced more products than we set out to release



Garnered interest across multiple verticals

US DoD ESTABLISHES MICROELECTRONICS COMMONS, INVESTS \$2B

MICROELECTRONICS COMMONS

\$2B

Allocated by US Department of Defense to establish the Microelectronics Commons as part of the CHIPS Act

\$238M

Awarded to ME Commons in FY23 for FY24 operations

8

Hubs

Eight regional innovation hubs have been established to accelerate the Lab-to-Fab transition & produce microchips at scale

460

Members

Awarded across eight hubs. The CLAWS hub has the lowest membership, with seven members led by NSCU

CLAWS HUB LEAD & MEMBERS

LEAD

**NC STATE
UNIVERSITY**

MEMBERS

ADROIT MATERIALS

BLUGLASS

COHERENT



kyma
technologies

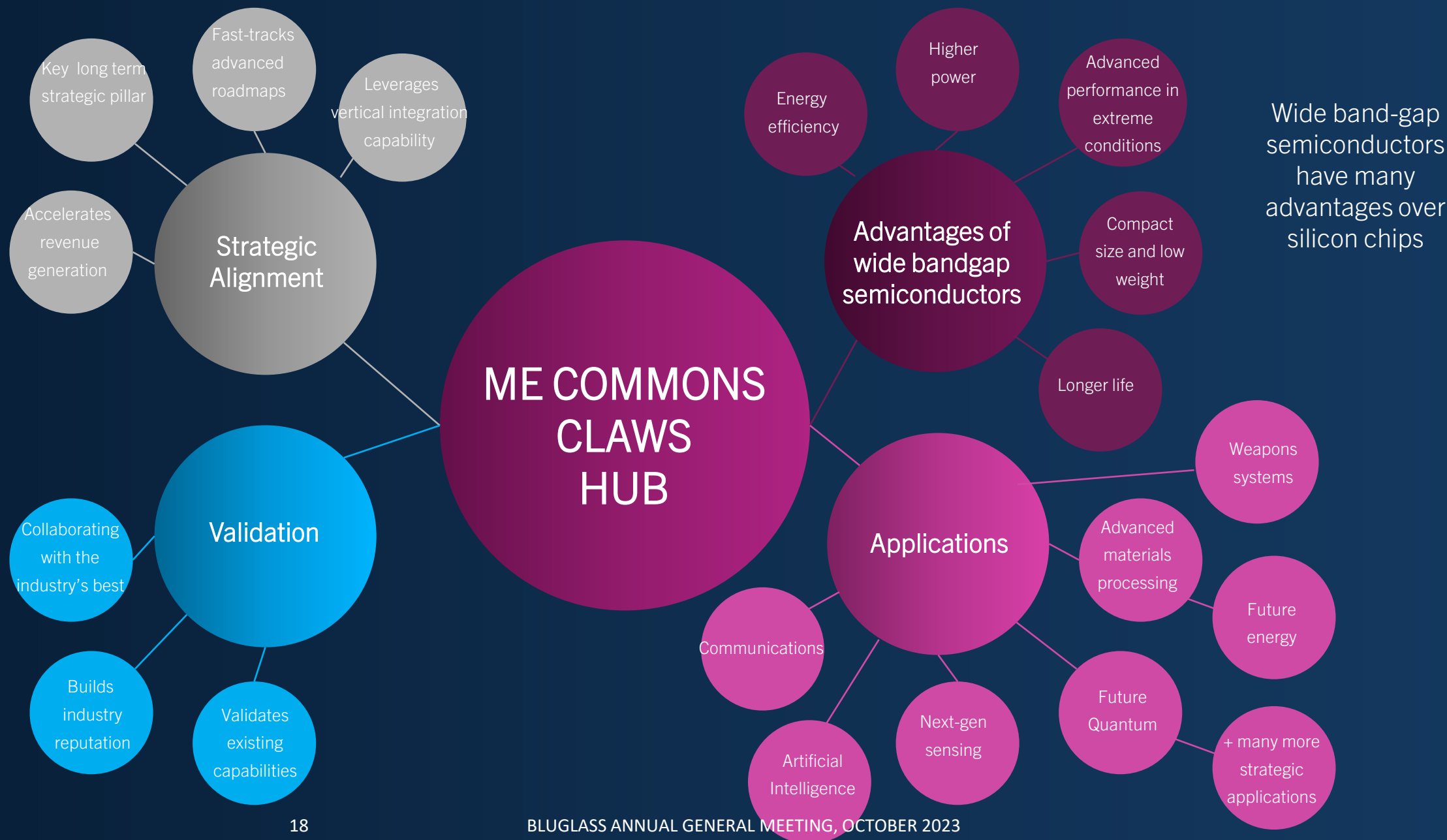


**NORTH CAROLINA
AGRICULTURAL AND TECHNICAL
STATE UNIVERSITY**

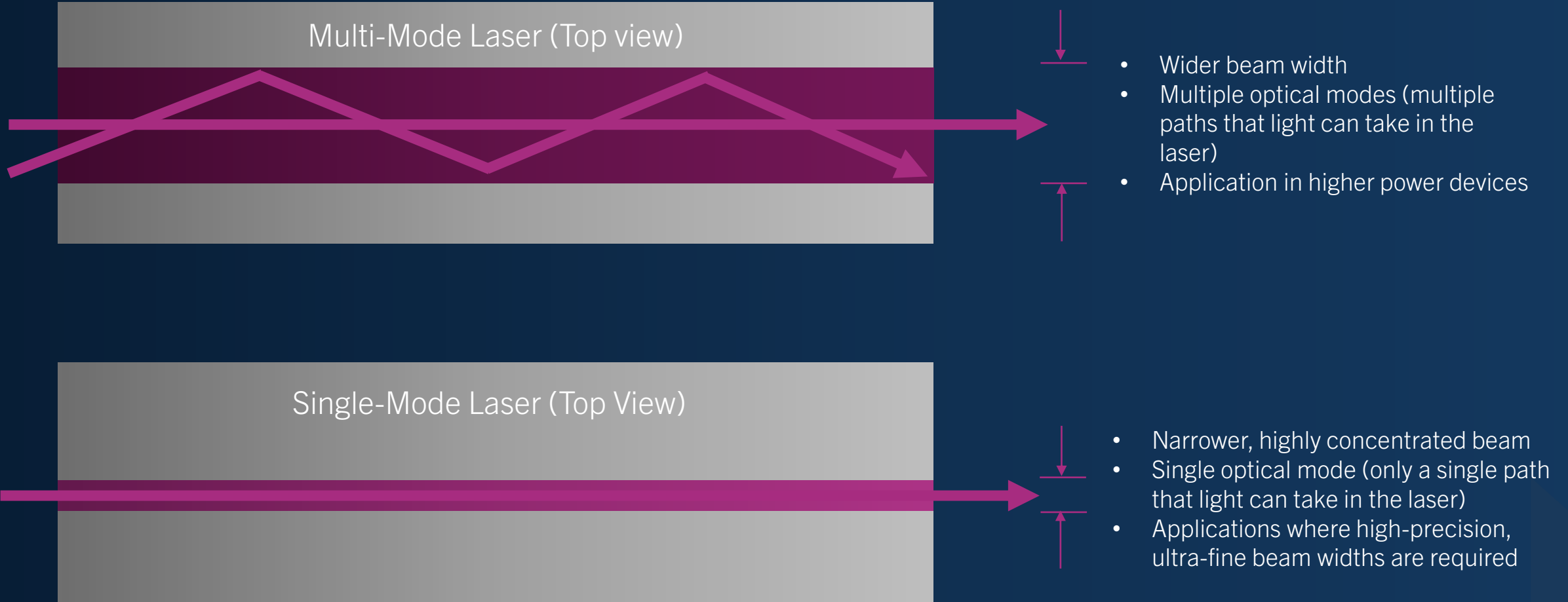
Wolfspeed

2023

CLAWS HUB ALIGNS PERFECTLY WITH BLUGLASS' LONG-TERM STRATEGY



MULTI-MODE VS SINGLE MODE LASERS



BLUGLASS TECHNOLOGY ROADMAP

Launched GaN Products (Core Capabilities)

- Portfolio spanning 405, 420nm & 450nm in Single-mode & multi-modes
- Continued improvement in performance & reliability
- Initial sales - Working to qualify lasers in customer applications

Add Novel Capabilities

- Launch Distributed FeedBack (DFB) lasers for quantum applications
- DFB lasers are not commercially available at present
- Unique product positioning growing presence in higher ASP quantum and medical imaging markets

Establish BLG as Partner of Choice

- BLG positioned for break-out success as the only pure-play GaN laser provider
- Enhanced packaging and manufacturing flexibility
- Industry-leading performance and stand-out technology capabilities

Increase unique capabilities and technology to capture greater value over time

1

2

3

4

5

- Extend Wavelengths to ultra-violet (390nm) & green (525nm)
- Improve power conversion & reliability
- Offer greater form factor flexibility adding fiber-coupled packages
- Increasing sales and BLG reputation

Enhance & Extend Product Portfolio

- Higher ASP product offering such as Photonic Integrated Circuits (PICs) and multi-chip modules (MCMs)
- Ease of system integration for high-power material processing and quantum applications

Higher Value Offering (Integrated Functionality)

LAUNCHED BETTER PRODUCTS ACROSS MORE WAVELENGTHS

What we set-out to launch

Violet	397nm	
	405nm	MM – 1W SM – 100-200mW
	420nm	MM – 1W SM – 100-200mW
	450nm	
Blue		

MM: Multi Mode SM: Single Mode ♦ : Prototype

What we actually launched

397nm	SM – 200mW ♦
405nm	MM – 1W MM – 3W ♦ SM – 250mW
420nm	MM – 1W MM – 3W ♦ SM – 250mW
450nm	MM – 1W SM – 100mW

2023

BLUGLASS LASER PORTFOLIO AND DEVELOPMENT PIPELINE

		Available for Purchase	Higher-Value Products In Development			Next-gen (Premium value/margin) Products in Development
Violet	397nm	SM – 200mW ◆				
	405nm	MM – 1W	MM – 3W ◆			
		SM – 250mW	SM – 300mW-400mW			SM – 500mW
	420nm	MM – 1W	MM – 3W ◆			
SM – 250mW		SM – 300mW-400mW			SM – 500mW	
Blue	450nm	MM – 1W	MM – 1.6W	MM – 2.2W	MM – 3.5W	MM – 5W
		SM – 100mW	SM – 250mW			
	470nm		MM – 2W			
			SM – 100-250mW			
488nm					MM – 1.5-2W	
		SM – 100-200mW				
Green	525nm					
		MM – 0.25-1W				
		SM – 25-100mW				
		MM: Multi Mode	SM: Single Mode	◆ : Prototype		

MM: Multi Mode

SM: Single Mode

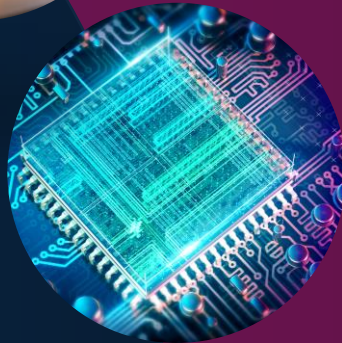
♦ : Prototype

2023

WORKING WITH CUSTOMERS ACROSS OUR TARGET VERTICALS



INDUSTRIAL



QUANTUM & SCIENTIFIC



BIOTECH



DEFENCE/ ENERGY & R&D



Multiple leading OEM customers

BluGlass' customers include leading OEMs across the industrial, medical, quantum & scientific sectors, and national labs and research organisations



Qualifying products across full portfolio

Customers are purchasing underserved and in-demand wavelengths across our full portfolio in single and multi-mode devices



Received first repeat customer order

BluGlass lasers are being qualified in customer applications to validate performance and lifetime



Validated our differentiated product offering

Our customers are purchasing both off-the-shelf standard products and highly customized products in flexible form factors, validating our flexible manufacturing offering and full-suite capability

CUSTOM PROJECTS SPEED PATH TO PROFITABILITY



Large custom laser projects are a key commercial strategy pillar; provide path to profitability



Won commercial partnership as CLAWS Hub member as part of \$238M Microelectronics Commons



Projects provide substantial and recurring revenues and can span multiple years



Complements direct-to-market visible laser offering



Builds reputation as the industry's partner of choice



Fast-tracks and funds advanced roadmaps and next-gen product timelines



Projects to occur alongside scaling GaN laser production & development

Custom projects form a key pillar of commercial strategy and path to profitability

GLOBAL PATENT PORTFOLIO

53

Internationally Granted
Patents in Key Markets

14

Applications in
PCT Phase

8

Patent Families

17

Trademarks



OUTLOOK & CATALYSTS

Outlook at a Glance



Rapidly growing market driven by global megatrends



Significant unmet demand for greater wavelength availability, manufacturing and packaging flexibility

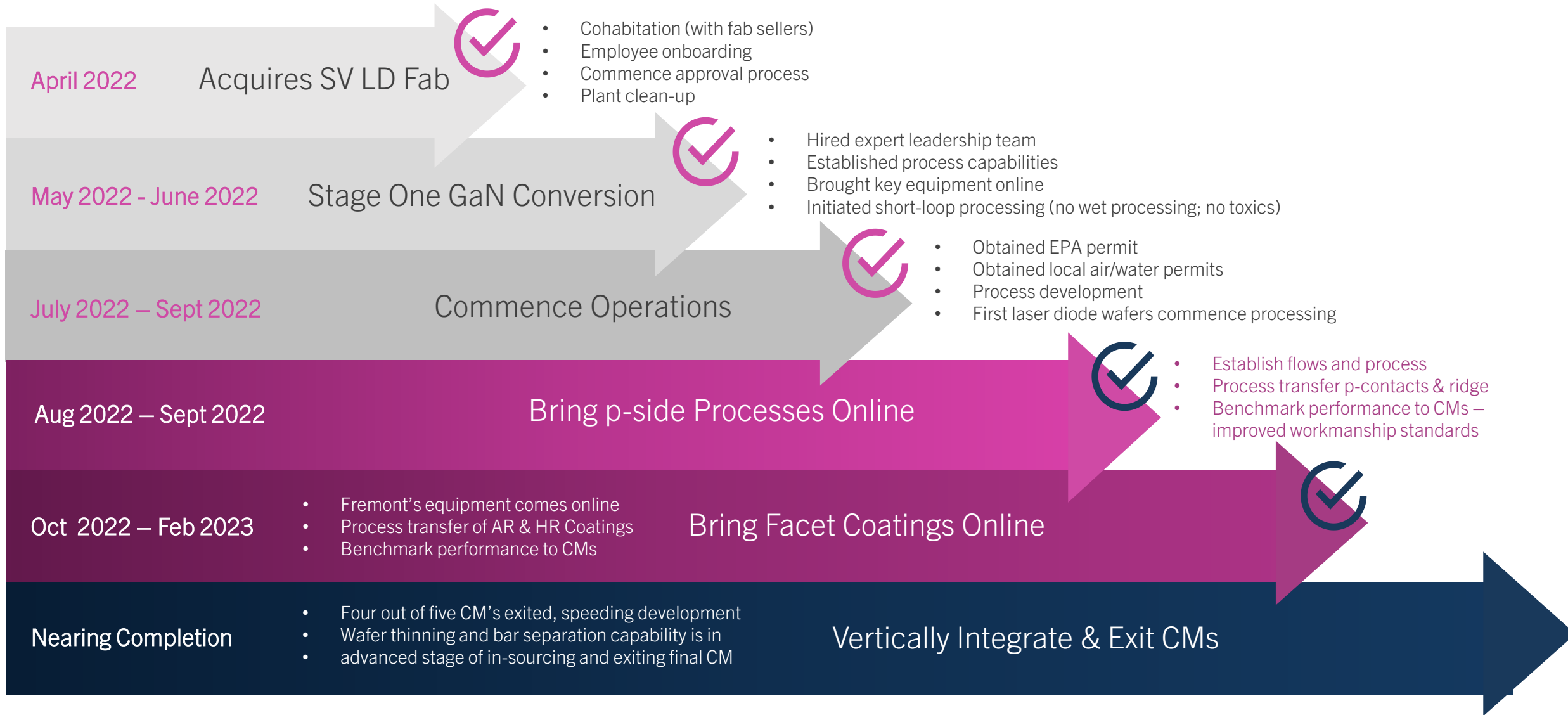


With Proprietary RPCVD technology, BluGlass is positioned as the only pure-play option for GaN Laser Diodes which are disrupting the worldwide laser market

UPCOMING MILESTONES

- 
- Complete vertical integration in Silicon Valley wafer fab
 - Repeat orders from customers
 - Integrate commercial packaging, testing & reliability equipment
 - Improve yield and reliability performance to increase shipments
 - Launch brighter & more efficient lasers in core wavelengths (405-450nm)
 - Sign distribution agreements with regional distributors
 - Qualify BLG lasers in customer products
 - Demonstrate 470nm & 488nm products
 - Scale to volume orders, grow revenues
 - Demonstrate green lasers
 - Demonstrate higher-value multiple-function solutions – multi-chip modules

IN-SOURCING FREMONT PROGRESS - MORE SPEED, BETTER CAPABILITY



BLUGLASS: THE WORLD'S LEADING PURE PLAY VISIBLE LASER SUPPLIER

GaN lasers are disrupting the US\$25B laser market

- GaN lasers are forecast to be a US\$2.5B segment of the broader laser market by 2025
- Visible GaN lasers offer a quantum leap over traditional infrared lasers in precision and efficiency, with adoption accelerating across quantum, scientific, biotech, and defense applications

Highly constrained market with few competitors

- One of just a handful of GaN laser manufacturers globally, operating in a market with high barriers to entry
- BluGlass is the only pure-play GaN laser supplier not captive in commoditised markets
- Competitors are typically high-volume, low-product mix businesses, with wavelength and form factor constraints
- Significant unmet demand for packaging and manufacturing flexibility

BluGlass is the solution

- Full-suite pure-play GaN laser supplier disrupting the rapidly expanding worldwide visible laser market
- Positioned as the supplier of choice with flexible product offerings, design, and manufacturing capabilities
- Secured orders from leading industrial and quantum OEMs, an international energy research institute, and medical device manufacturers
- Proprietary RPCVD manufacturing process offers significant competitive advantages, facilitating novel laser architectures, brighter, and higher efficiency laser diodes



APPENDIX:

GLOSSARY

Term	Definition
Gallium Nitride (GaN)	Gallium nitride (GaN) is an important semiconductor material used in billions of electronics devices around the globe. GaN is a direct bandgap semiconductor commonly used in blue light-emitting diodes and laser diodes for a wide range of commercial applications due to its high-power and high-frequency properties.
Laser Diode	A Laser Diode is a semiconductor device similar to a light-emitting diode (LED). It uses a p-n junction and AR and HR coatings to emit focused coherent light, where the simulated light waves are the same frequency and phase.
Wavelength	Light waves can be described by the distance between two successive peaks of the wave - a length known as the wavelength. Different wavelengths of light appear to our eyes as different colours. Shorter wavelengths appear blue or violet, and longer wavelengths appear red.
Form Factor	Form factor is the hardware design and package of the laser diode ready for customer integration. BluGlass provides flexible integration options, such as combining our laser diode components with heatsinks, sealed environments, and even optical components to provide easier to use solutions for our customers
Single-mode Laser	A single mode laser contains one output beam mode, measured by beam quality. Single mode lasers are harder to achieve, but their high-quality beam is highly desirable in many applications where high precision and highly focused power is required such as medical and quantum applications.
Multi-mode Laser	A multimode laser has multiple modes in the output beam mode with a beam quality of >2.0 . Multi-mode lasers have great application in high power applications such as material processing and defence applications.
RPCVD	BluGlass' proprietary technology, Remote Plasma Chemical Vapour Deposition (RPCVD) works in a similar way to the industry incumbent technology, MOCVD, where gases are introduced into a reaction chamber for deposition (growth) of thin-films. Whereas MOCVD uses thermal decomposition of ammonia (NH_3) to provide active nitrogen, RPCVD uses a nitrogen (N_2) plasma source which allows for the growth of GaN at much lower temperatures while maintaining the critical crystal quality necessary for high performance devices.
MOCVD	Metal Organic Chemical Vapour Deposition (MOCVD) is a technology that is used to deposit very thin layers of atoms onto a semiconductor wafer (wafers are thin disks mostly made of sapphire or silicon). It is the industry standard method of manufacture of gallium nitride semiconductors.



2023

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THANK-YOU & QUESTIONS