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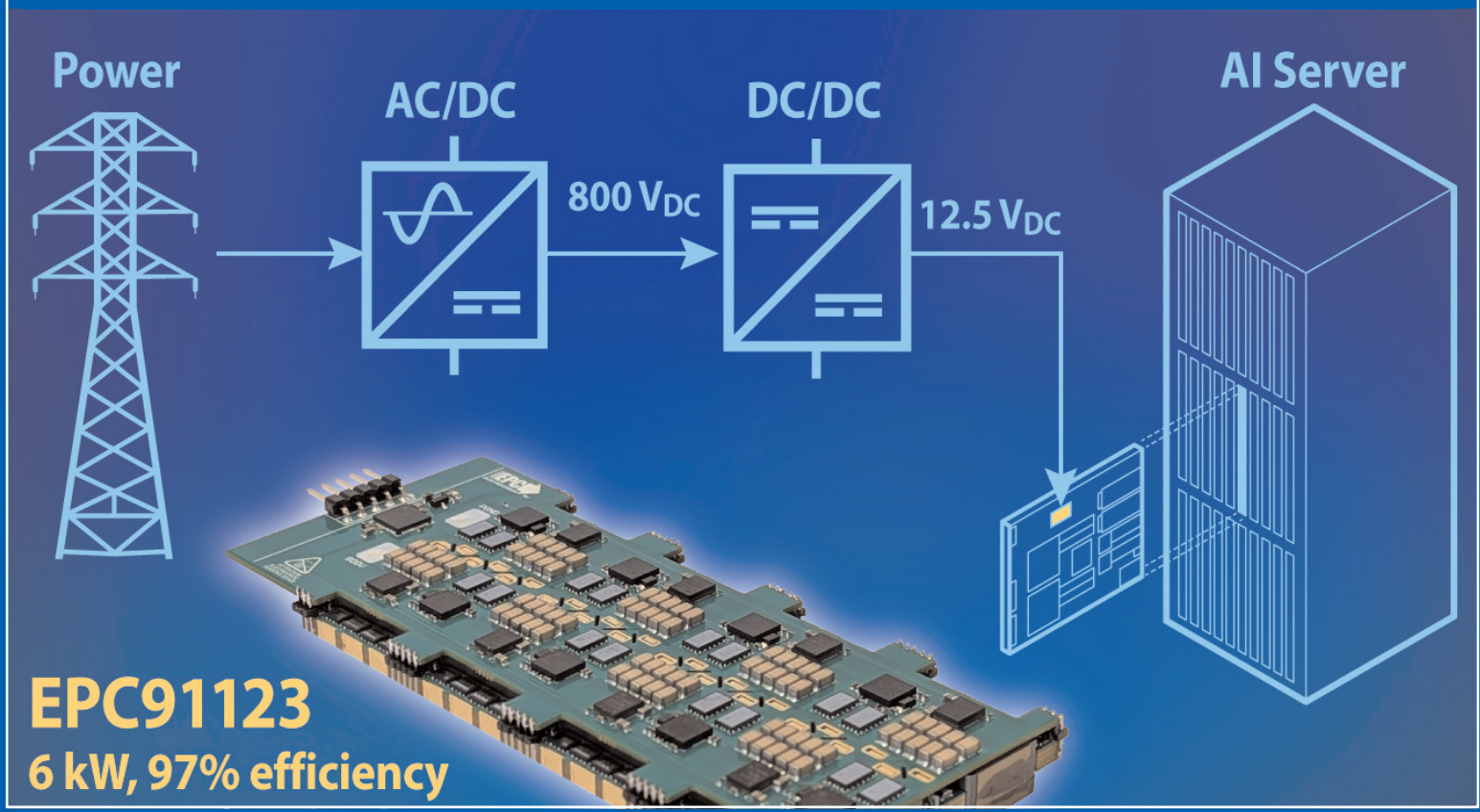
www.semiconductor-today.com

Power semiconductor firms supporting 800V_{DC} architecture for AI data centers



Skyworks and Qorvo to merge • Wolfspeed exits Chapter 11
Axcelis & Veeco to merge • POET raises $75m • Vertical raises $11m

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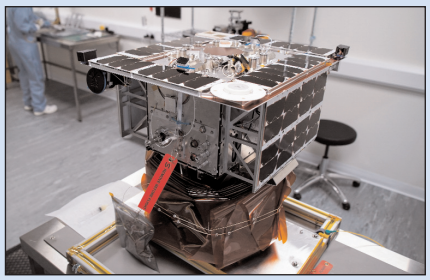
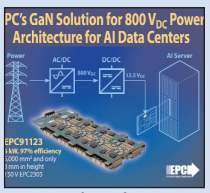


p38 Space Forge has signed an MoU with United Semiconductors to develop a supply chain for space-grown materials.

p63 Ascent Solar has signed an MoU with Star Catcher Industries targeting the proliferation of thin-film PV solutions in space environments.



Cover image: As one of several firms announcing support for NVIDIA's 800VDC power architecture for AI data centers, EPC is developing a low-cost, low-profile GaN-based, 6kW 800V-to-12.5V power converter. **p16**

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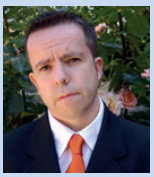

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***Semiconductor Today* covers the R&D and manufacturing of compound semiconductor and advanced silicon materials and devices** (e.g. GaAs, InP and SiGe wafers, chips and modules for microelectronic and optoelectronic devices such as RFICs, lasers and LEDs in wireless and optical communications, etc).

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- technology, applications & markets);
- feature articles (technology, markets,
- regional profiles);
- conference reports;
- event calendar and event previews;
- suppliers' directory.

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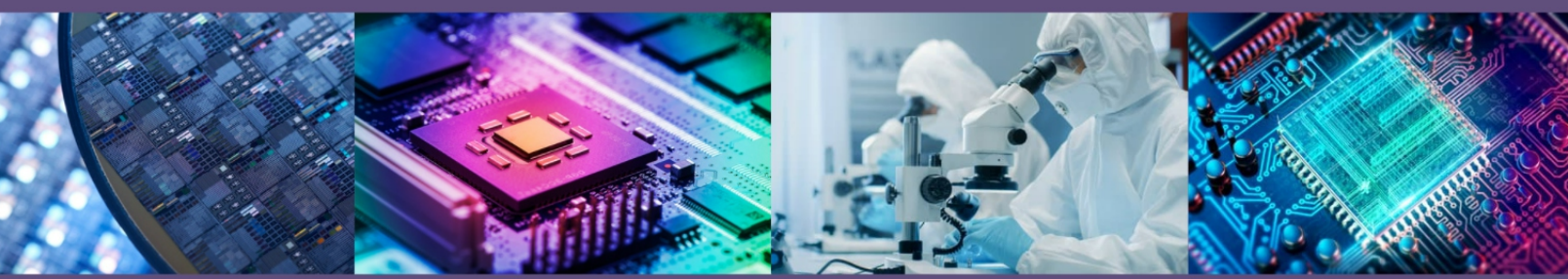

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news

Power GaN market growing at 42% CAGR to $3bn by 2030

Telecom & infrastructure growing at 53%, driven by AI data centers; automotive & mobility segment growing at 73% CAGR

The power gallium nitride (GaN) device market is rising at a compound annual growth rate (CAGR) of 42% from $355m in 2024 then growing sixfold from now to about $3bn by 2030, forecasts Yole Group in its report 'Power GaN 2025'.

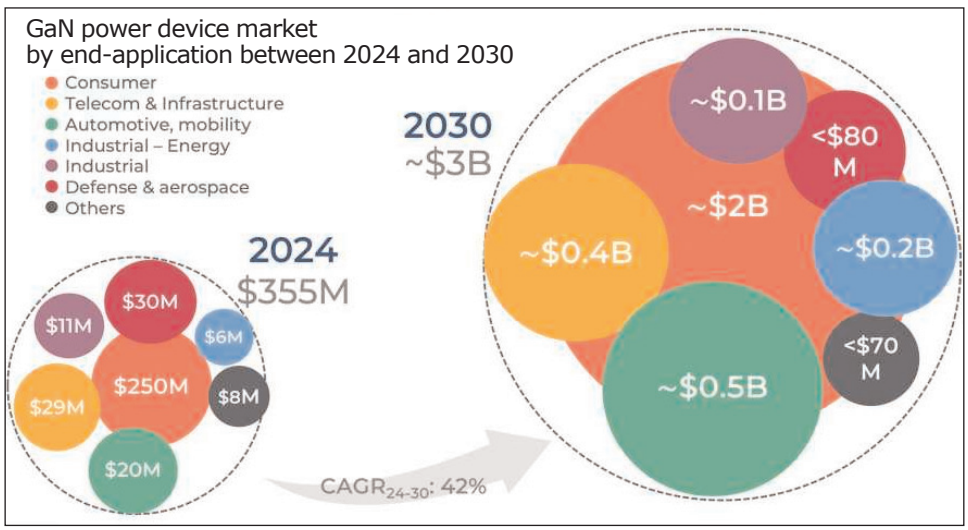
GaN has emerged as one of the most disruptive semiconductor technologies of the decade, offering a compact, efficient and thermally superior alternative to silicon-based systems. "Power GaN is transitioning from promise to production reality," says Roy Dagher, technology & market analyst, Compound Semiconductors, at Yole Group. Consumer applications, particularly fast chargers, have been the early adopters, driving volume growth and ecosystem maturity. "We see an acceleration across all end markets," Dagher adds. "Its efficiency, compactness, and performance advantages make it a key technology for the next decade of power electronics."

By 2030, the consumer and mobile segment is projected to constitute over 50% of the total power GaN device market.

Data-center opportunity for GaN

In particular, the explosion in AI computing and data traffic is transforming data-center power architectures. The growing number of servers and communication systems is driving electricity demand and CO_2 emissions, intensifying the need for higher-efficiency power conversion. GaN is particularly well suited for power supply units (PSU) above 3kW, delivering improved form factors, reduced heat losses, and lower operational costs.

In 2025, NVIDIA's new data-center architecture announcement has catalyzed a wave of collaborations with leading power semiconductor makers, including Texas Instruments, Navitas, Infineon Technologies, Innoscience, and onsemi. The aim is to integrate GaN devices into 800V HVDC power systems. These partnerships mark the beginning of large-scale GaN deployment, with Yole Group anticipating first commercial roll-outs around 2027.



The telecom & infrastructure segments collectively are hence expected to grow at a 53% CAGR to over $380m in GaN revenues by 2030, making data centers one of the most promising growth pillars of the power GaN market.

"Data centers represent a turning point for GaN," says Dagher. "The combination of AI, electrification and sustainability goals makes GaN indispensable for next-generation server and telecom power systems."

Other segments are also gaining traction, with Enphase Energy's first GaN-based micro-inverter and Changan Automobile's first GaN-based onboard charger (OBC) marking significant milestones that strengthen confidence in GaN technology and pave the way for wider penetration across the power electronics market.

Despite short-term delays linked to the xEV market slowdown, the automotive & mobility segment is expected to grow at a 73% CAGR between 2024 and 2030.

Coexistence of integrated and foundry ecosystems reinforcing resilience and scalability

As the semiconductor industry strives for higher efficiency and sustainability, GaN now stands at the core of the global energy and digital transition, reckons Yole. From fast chargers to data centers and electric vehicles (EV), power GaN is reshaping the way energy is converted and managed, the firm adds.

At the same time, the market is shifting toward integrated device manufacturer (IDM)-driven business models — where vertical integration offers tighter control over technology and supply — as foundries remain essential to the industry's growth. Established foundries are expanding their GaN capacity, and new entrants are emerging to serve fabless companies and IDMs seeking additional sourcing flexibility. This coexistence between integrated and foundry-based ecosystems is reinforcing the resilience and scalability of the global power GaN supply chain, concludes Yole.

www.yolegroup.com/product/report/power-gan-2025

UK Semiconductor Centre forms Interim Steering Group

Office to be sited in Knowledge Quarter of Kings Cross, London

The UK Semiconductor Centre has moved into its next phase of mobilization with the announcement of its newly formed Interim Steering Group.

The Group has agreed that the site of the UK Semiconductor Centre office will be in the Knowledge Quarter of Kings Cross, London – an internationally accessible location with strong transport links. The UK Semiconductor Centre team will be geographically distributed across the UK to support clusters and regions.

Backed by at least £19m in UK government funding, the Centre will serve as a national independent hub to accelerate growth and innovation in the industry. The permanent steering group will be recruited in 2026.

Co-chaired by Jonathan Flint CBE, chair of the board of Compound Semiconductor Applications (CSA) Catapult, and Jalal Bagherli CBE,

Interim Steering Group.

the Interim Steering Group consists of leading experts from across industry and academia. They will guide the development and strategic direction of the Centre.

The Group will ensure that the Centre's activities are closely aligned with sector priorities and that there is an ongoing dialogue with industry and academia.

The members of the Interim Steering Group are:

- Dr Jalal Bagherli CBE — chairman of PTSL, chair of Nanoco technologies Plc, co-chair of the UK Semiconductor Advisory Panel;
- Jonathan Flint CBE — CSA Catapult's chair and chair of Oxford Technical Services;
- Nick McKeown — professor emeritus in the Electrical Engineering and Computer Science departments at Stanford University, visiting professor at Oxford University, board member of ARIA;
- Jillian Hughes — head of semiconductors at Techworks;
- Sean Redmond — president, Silicon Catalyst Europe;
- Jutta Meier — chief executive officer & chief financial officer, IQE plc.

The UK Semiconductor Centre will act as a single gateway for international collaboration, making it easier for global firms and governments to connect with the UK industry and explore new partnerships.

Raj Gawera appointed as chief operating officer

Raj Gawera has been appointed as chief operating officer (COO) of the UK Semiconductor Centre, leading its early mobilization and engagement as it builds plans to champion the UK semiconductor sector on the global stage.

Gawera's experience in the semiconductor industry includes being VP & managing director at Samsung Semiconductor (Cambridge and Denmark), where he led silicon and software development for the firm's connectivity solutions, overseeing several European development centers whose technologies now feature in hundreds of millions of devices worldwide.

He also played a pioneering role in mobile technology, helping to demonstrate one of the first 3G video calls in 1998 and co-founding 3G technology company UbiNetics. He later joined Cambridge Silicon Radio (CSR) as VP of marketing, driving the handset business that supplied connectivity chips into tier-1 OEMs.

Gawera also has board-level experience from being chair of the board for Cambridge Wireless and, more recently, being appointed a non-executive director of CSA Catapult in 2021.

In his new role, Gawera will be responsible for accelerating the Centre's impact across its five core missions: creating stronger global partnerships and greater inward investment; scaling-up UK semiconductor companies; creating a connected and more visible UK ecosystem; aligning industry and academia behind a strategic semiconductor roadmap; and developing the skilled workforce for the industry.

"The missions will build a world-class UK semiconductor ecosystem that drives scale-up, attracts global investment and partnerships to fuel growth," says Gawera.

"Raj's extensive track record and leadership will be instrumental in delivering the UK Semiconductor Centre's missions," believes Jonathan Flint CBE, co-chair of the UK Semiconductor Centre's Interim Steering Committee. "His appointment reflects our commitment to fostering international collaboration, driving foreign direct investment, sector scale-up, and ensuring the UK semiconductor industry's global competitiveness," he adds.

"Raj's experience and leadership will be pivotal for the UK Semiconductor Centre as we move to strengthen the nation's semiconductor capabilities and deliver our missions, from fostering international collaboration and driving inward investment to enhancing the UK's global competitiveness in this critical sector," adds Interim Steering Committee co-chair Dr Jalal Bagherli CBE.

www.uksemicentre.org.uk

Skyworks and Qorvo to merge into $7.7bn-revenue RF, analog & mixed-signal semiconductor firm

Complementary product and technology portfolios create $5.1bn Mobile and $2.6bn Broad Markets businesses

Skyworks Solutions Inc of Irvine, CA (which manufactures analog and mixed-signal semiconductors) and Qorvo Inc of Greensboro, NC (which provides core technologies and RF solutions for mobile, infrastructure and defense applications) have agreed to merge in a cash-and-stock transaction that values the combined enterprise at $22bn, creating a US-based supplier of high-performance RF, analog and mixed-signal semiconductors.

"Combining Skyworks' and Qorvo's complementary portfolios and world-class engineering teams will strengthen our ability to meet growing customer demand across Mobile and diversified Broad Markets," believes Skyworks' CEO & president Phil Brace. "With enhanced scale, a more diversified customer base and operational synergies, we can bring even greater innovation to our customers and sustainable value to our shareholders," he adds.

"Qorvo and Skyworks share a culture of innovation and a commitment to solving our customers' most complex challenges," says Qorvo's CEO & president Bob Bruggeworth. "Together with Skyworks, we can accelerate innovation and deliver broader and more comprehensive solutions across numerous growth areas," he adds. "We are excited to leverage the combined strengths of our teams and product and technology portfolios to build on our capabilities in Mobile and significantly expand our presence in defense and aerospace, edge IoT, AI data-center, automotive and other industries powered by secular growth trends."

Strategic rationale and transaction highlights

The firms expect the transaction to deliver significant long-term value for customers, employees and shareholders:

- Enhanced scale and financial profile: With combined pro forma revenue of about $7.7bn and adjusted EBITDA of $2.1bn, the combined company should be better positioned to compete against larger players, supported by a stronger, more balanced revenue base that enables more predictable performance, a more efficient cost structure and resilient cash generation through cycles.
- Stronger innovation pipeline: The merger creates a global RF, analog and power technology firm that can provide more highly integrated, complete solutions, as well as a broad range of products and technologies. The combined firm will bring together about 8000 engineers and technical experts, and over 12,000 issued and pending patents, enabling faster development of advanced, system-level solutions and unlocking new design-win opportunities to meet growing demand, it is expected.
- Creates $5.1bn Mobile business: The merger brings together complementary RF technologies and best-in-class products, expanding opportunities in Mobile while driving greater revenue stability. The broader portfolio is expected to enhance competitiveness across platforms, deepen customer integration and diversify the technology base, while strengthening the combined firm's position to address rising RF complexity.
- Establishes $2.6bn diversified Broad Markets platform: The transaction creates a $2.6bn Broad Markets platform with a growing and profitable total addressable market (TAM) across defense & aerospace, edge IoT, AI data-center and automotive markets, which are characterized by secular growth trends, long product life-cycles and favorable gross margins.
- Advances domestic manufacturing position and improves utilization: The combined company will strengthen its domestic production capacity and enhance its capital efficiency, supported by a robust network of supply chain partners to meet the needs of high-volume and highly specialized customers.
- Immediately accretive: The transaction is expected to be immediately and meaningfully accretive to non-GAAP EPS post-close, with $500m or more of annual cost synergies within 24–36 months post-close when the companies are fully integrated.

Transaction details

Qorvo shareholders will receive $32.50 in cash and 0.960 of a Skyworks common share for each Qorvo share held at the close of the transaction, which implies a combined enterprise value of about $22bn.

Skyworks shareholders will own about 63% of the combined firm, while Qorvo shareholders will own about 37%, on a fully diluted basis. Phil Brace will serve as CEO, while Bob Bruggeworth will join the board of directors of the combined company. The board will comprise 11 directors: eight from Skyworks and three from Qorvo.

Skyworks plans to fund the cash portion of the transaction using a combination of cash on hand and additional financing. It has obtained debt financing commitments from Goldman Sachs Bank USA. The transaction is not subject to any financing conditions. The combined company's net leverage at closing is expected to be approximately 1.0x last-twelve-month adjusted EBITDA. It is reckoned that this capital structure will allow for continued investments in the business to drive shareholder value.

Timing and approvals

The boards of directors of both companies have unanimously approved the transaction, which is expected to close in early 2027, subject to the receipt of required regulatory approvals, approval from both firms' shareholders, and the satisfaction of other customary closing conditions.

Starboard Value LP, which is an approximately 8% shareholder of Qorvo, has signed a voting agreement in support of the pending transaction.

Skyworks and Qorvo announce above-guidance preliminary September-quarter results

Skyworks Solutions and Qorvo have reported preliminary September-quarter financial results exceeding their respective guidance.

For its fiscal second-quarter 2026 (ended 27 September 2025), Qorvo Inc of Greensboro, NC, USA (which provides core technologies and RF solutions for mobile, infrastructure and defense applications) has reported revenue of $1058.5m, compared with its guidance (given on 29 July) of $1025m±$50m.

On a non-GAAP basis, gross margin is 49.7%, near the upper end of the guidance range of 48–50%. Diluted earnings per share is $2.22, near the upper end of the guidance range of $2.00±$0.25.

For its fiscal fourth-quarter 2025 (ended 3 October), Skyworks Solutions Inc of Irvine, CA, USA (which manufactures analog and mixed-signal semiconductors) has reported revenue of $1.1bn, exceeding its guidance (given on 5 August) of $1–1.03bn.

On a non-GAAP basis, operating income is $264m. Diluted earnings per share is $1.76, surpassing the guidance of $1.40. Operating cash flow is $200m and free cash flow is $144m. Skyworks has consequently declared a quarterly dividend of $0.71 per share.

For full-year fiscal 2025, Skyworks' revenue is $4.09bn. With operating income is $995m, diluted EPS is $5.93.

Operating cash flow is $1.30bn and free cash flow is $1.11bn.

Qorvo is announcing full financial results for its fiscal Q2/2026 on 3 November. Skyworks will report its full results for its fiscal Q4/2025 on 4 November.

www.qorvo.com
www.skyworksinc.com

Wolfspeed completes financial restructuring and emerges from Chapter 11 protection

Growth plan to leverage installed 200mm capacity, self-funded through free cash flow generation

Wolfspeed Inc of Durham, NC, USA — which makes silicon carbide (SiC) materials and power semiconductor devices — has completed its financial restructuring process and emergence from Chapter 11 protection.

Through the restructuring process, Wolfspeed has reduced its total debt by about 70%, with maturities extended to 2030, and lowered its annual cash interest expense by roughly 60%. In addition, the firm believes that it maintains ample liquidity to continue supplying customers with silicon carbide solutions. With a self-funded business plan supported by free cash flow generation, Wolfspeed reckons that it is well positioned to leverage its vertically integrated 200mm manufacturing footprint — underpinned by a secure and scalable US-based supply chain — to drive sustainable growth.

"Wolfspeed has emerged from its expedited restructuring process, marking the beginning of a new era, which we are entering with new energy and a renewed commitment to the growth mindset and entrepreneurial spirit that have powered Wolfspeed since its inception," says CEO Robert Feurle. "As we enter this new era, we do so with much improved financial stability, a scaled, greenfield and vertically integrated 200mm facility footprint, and our large capital deployment behind us," he adds.

"We are well positioned to capture rising demand in end markets, such as AI, EVs, industrial and energy, that are rapidly growing and recognizing silicon carbide's potential," Feurle believes. "I look forward to unleashing the full potential of the platform that we have built with a much stronger financial foundation to support us."

Five directors appointed to board

Wolfspeed has appointed Anthony M. Abate, Mike Bokan, Eric Musser, Hong Q. Hou and (pending certain regulatory approvals) Aris Bolisay to its board (joining Mark Jensen and Paul Walsh, who continue in their roles as directors). Abate succeeds Tom Werner as chairman.

"They bring extensive semiconductor and industry knowledge, deep accounting and finance expertise, and experience guiding companies towards profitability," says CEO Robert Feurle. "Their insight and leadership will be instrumental as we build on the current momentum underway, oversee the execution of Wolfspeed's strategic priorities, and strengthen our position in the global silicon carbide market."

Tom Werner, Glenda Dorchak, John Hodge, Darren Jackson, Duy-Loan Le, and Marvin Riley have stepped down from the board.

"I would like to thank our former board members for their service and dedication to Wolfspeed, particularly over the last few months as we have navigated our financial restructuring," Feurle says. "Their leadership, input and expertise have been vital throughout this."

Abate is a board director, entrepreneur and executive with over four decades of leadership in tech, telecom and consumer sectors. He is currently chair of global tier-1 IP network operator GTT Communications, business communications and collaboration service provider Mitel, and specialty iron-ore mining company Tacora Resources.

Bokan joined memory and storage solutions firm Micron Technology Inc in 1996. Roles included general manager of the Crucial division, director of sales (2003), senior director of sales (2007), VP of worldwide OEM sales (2008), corporate VP of worldwide sales (2017) and senior VP of worldwide sales from 2018 until retiring in May 2025. He built and sustained deep relationships with OEM, hyperscale and distribution partners, helping to drive record revenue for the firm.

Musser recently completed a 39-year career with Corning Inc, ending as president & chief operating officer. In 2005, he was appointed general manager of Corning Optical Fiber, where he restored stability and growth following the telecoms industry downturn of the early-2000s. In 2007, he became general manager, Corning Greater China and president of Corning International. In 2014, he led Corning Technologies & International businesses encompassing automotive and life-sciences, and international business development. In 2020, Musser was appointed president & chief operating officer, while also serving on the US–China Business Council board of directors.

Hou has been president & CEO of Semtech since June 2024 and a board member since July 2023. He was most recently president of the Semiconductor Group at automated wafer handling and contamination control solutions provider Brooks Automation. Prior to that, he was corporate VP & general manager of the cloud and edge networking group of Intel Corp. Previously, Hou held executive leadership positions at Fabrinet, AXT and Emcore, and technical roles at Bell Laboratories and Sandia National Laboratories.

Bolisay is VP of finance at Tokyo-based Renesas Electronics Corp. He was head of its Accounting and Control Division from March 2019 to June 2021. He was senior director and corporate controller as well as a director and assistant controller at US-based Integrated Device Technology Inc (acquired by Renesas) from June 2014 to March 2019.

www.wolfspeed.com

Wolfspeed hires Matthias Buchner as senior VP of global sales & chief marketing officer

Senior VP of marketing of Infineon's Power & Sensor Systems Division to boost focus on 200mm silicon carbide

Wolfspeed Inc of Durham, NC, USA — which makes silicon carbide (SiC) materials and power semiconductor devices — has appointed Matthias Buchner as senior VP of global sales & chief marketing officer, effective 1 December. He will report directly to CEO Robert Feurle.

Buchner will lead Wolfspeed's global sales and marketing organizations, with a focus on leveraging the firm's silicon carbide devices, produced on its vertically integrated 200mm manufacturing platform.

His appointment comes as Wolfspeed sharpens its focus on product innovation and device production — reflecting its scaling of silicon carbide manufacturing to meet global demand. It also supports Wolfspeed's strategy to broaden its customer base across diverse, high-growth markets including automotive, renewable energy, industrial power systems, and AI-driven data infrastructure.

Buchner joins Wolfspeed from Infineon Technologies AG, where he was most recently senior VP of marketing for the Power & Sensor Systems Division, responsible for strategic communication, partnership management, distribution marketing, digital marketing and marketing operations for a $3bn+ business. Over his more than 20-year career, he has held senior leadership positions at Infineon, Micron Technology, and other technology firms, with experience in both silicon and silicon carbide power solutions, business development, and global customer engagement.

"Attracting a world-class sales and marketing executive like Matthias at this critical juncture underscores Wolfspeed's commitment to capturing the immense opportunities ahead," says president & CEO Robert Feurle. "His global leadership experience across silicon and silicon carbide technologies — spanning automotive, industrial, and other competitive markets — will be instrumental as we strengthen our customer relationships and expand into rapidly growing segments such as AI data centers, renewable energy, grid infrastructure, and aerospace & defense," he adds. "With Matthias joining our team, Wolfspeed is exceptionally well positioned to translate our vertically integrated silicon carbide platform into sustainable, profitable growth."

Buchner's appointment strengthens Wolfspeed's leadership team as it continues to focus on improving operational execution, scaling manufacturing capacity, and expanding its position in silicon carbide technology.

"Wolfspeed's deep domain expertise in producing silicon carbide devices sets the industry standard for performance and quality in today's competitive landscape," comments Buchner. "Building strong, trusting relationships with our customers will be a key focus for me immediately out of the gate, as we work together to accelerate the global transition from silicon-based to silicon carbide-based technologies."

www.wolfspeed.com

Recent strategic and operational progress

Wolfspeed recently completed a strategic refinancing initiative that has strengthened its balance sheet, positioning it for sustained, profitable growth. In conjunction, the firm has rationalized its global production footprint to align with demand and enhance capital efficiency. This includes the planned closure of its 150mm device fabrication facility on the Durham campus by the end of 2025, as well as the decision to discontinue development of a proposed device fab in Saarland, Germany. These actions streamline Wolfspeed's manufacturing operations around its 200mm silicon carbide platform and support its long-term focus on operational excellence, productivity and profitability.

Wolfspeed has invested in next-generation facilities in the USA, including its advanced materials factory in North Carolina, device fabrication operations in New York, and device packaging facility in Arkansas. Together, these sites provide ample capacity and flexibility to serve customer needs efficiently and reliably from a consolidated US footprint, it is reckoned.

Infineon and ROHM collaborating on silicon carbide power electronics packages

MoU to enable each other as a second source for select SiC products, enhancing design and procurement flexibility

Infineon Technologies AG of Munich, Germany and ROHM Co Ltd of Kyoto, Japan have signed a memorandum of understanding to collaborate on packages for silicon carbide (SiC) power semiconductors used in applications such as on-board chargers, photovoltaics, energy storage systems and AI data centers. Specifically, the partners aim to enable each other as second sources of selected packages for SiC power devices, which should increase design and procurement flexibility for customers. In the future, customers will be able to source devices with compatible housings from both Infineon and ROHM. The collaboration should ensure seamless compatibility and interchangeability to match specific customer needs.

"Our collaboration will provide customers with a wider range of options and greater flexibility in their design and procurement processes, enabling them to develop more energy-efficient applications that will further drive decarbonization," says Dr Peter Wawer, division president Green Industrial Power at Infineon.

"By working together, we can drive innovation, reduce complexity and increase customer satisfaction, ultimately shaping the future of the power electronics industry," says Dr Kazuhide Ino, board member and managing executive officer in charge of Power Devices Business at ROHM.

Left: Dr Peter Wawer (division president Green Industrial Power at Infineon); right: Dr Kazuhide Ino (board member & managing executive officer, in charge of Power Devices Business at ROHM).

As part of the agreement, ROHM will adopt Infineon's top-side-cooling platform for SiC, including TOLT, D-DPAK, Q-DPAK, Q-DPAK dual, and H-DPAK packages. Infineon's top-side-cooling platform offers several benefits, including a standardized height of 2.3mm for all packages. This facilitates designs and reduces system costs for cooling, while also enabling better board space utilization and up to two times more power density.

At the same time, Infineon will take on ROHM's DOT-247 package with SiC half-bridge configuration to develop a compatible package. That will expand Infineon's recently announced Double TO-247 IGBT portfolio to include SiC half-bridge solutions. ROHM's DOT-247 delivers higher power density and reduces assembly effort compared with standard discrete packages. Featuring a unique structure that integrates two TO-247 packages, it enables the reduction of thermal resistance by about 15% and inductance by 50% compared with the TO-247. The advantages bring 2.3 times higher power density than the TO-247.

Infineon and ROHM plan to expand their collaboration in the future to include other packages with both silicon and wide-bandgap power technologies such as SiC and gallium nitride (GaN). This is expected to further strengthen the relationship between the two companies and provide customers with an even broader range of solutions and sourcing options.

Semiconductors based on SiC have improved the performance of high-power applications by switching electricity even more efficiently, enabling high reliability and robustness under extreme conditions, while allowing for even smaller designs. Using Infineon's and ROHM's SiC products, customers can develop energy-efficient solutions and increase power density for applications such as electric vehicle charging, renewable energy systems and AI data centers.

www.rohm.com/products/sic-power-devices
www.infineon.com

Infineon launches CoolSiC MOSFETs 1400V G2 in TO-247PLUS-4 Reflow package

Reflow soldering at 260°C for up to three cycles enables reliable operation with junction temperatures up to 200°C

Infineon Technologies AG of Munich, Germany has launched the CoolSiC MOSFETs 1400V G2 in the TO-247PLUS-4 Reflow package, supporting higher DC-link voltages and enabling improved thermal performance, reduced system size and enhanced reliability.

The new devices are targeted at addressing new design challenges (including reliable operation under harsh environmental conditions, robustness against transient overloads, and optimized overall system performance) for high-power applications such as electric vehicle charging, battery energy storage systems, and commercial, construction and agricultural vehicles (CAVs), which are driving the demand for higher system-level power density and efficiency to meet increasing performance expectations.

The CoolSiC MOSFETs 1400V G2 in the TO-247PLUS-4 Reflow package.

The package technology supports reflow soldering at 260°C for up to three cycles and enables reliable operation with junction temperatures up to 200°C, while ensuring high peak current capability. Leveraging the Infineon .XT interconnection technology, the devices deliver improved thermal performance and enhanced mechanical robustness for demanding environments. The new 1400V voltage class provides additional margin for faster switching and simplifies protection measures against overvoltage. This eliminates the need for power de-rating and contributes to overall system robustness.

The CoolSiC MOSFETs 1400V G2 in the TO-247PLUS-4 Reflow package are available in $R_{DS(on)}$ classes from 6mΩ to 29mΩ. Infineon also offers CoolSiC MOSFETs 1400V in a TO-247-4 package with high creepage. $R_{DS(on)}$ classes for this portfolio range from 11mΩ to 38mΩ, with devices suitable also for applications such as photovoltaic.

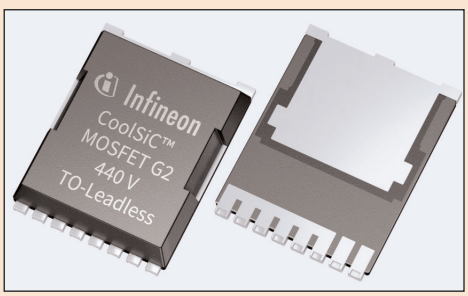
www.infineon.com/part/IMYR140R006M2H

Infineon adds 400V & 440V MOSFETs to CoolSiC portfolio

Improved thermal performance, system efficiency and power density targeted at high-power and compute-intensive applications

Infineon Technologies AG of Munich, Germany has expanded its CoolSiC MOSFETs 400V G2 portfolio with the top-side-cooled (TSC) TOLT package as well as the TO-247-3 and TO-247-4 packages. In addition, three new products in the TOLL package have been introduced, with rated voltages of 440V (continuous) and 455V (transient).

The new CoolSiC MOSFETs are said to deliver improved thermal performance, system efficiency, and power density. They have been specifically designed to meet the requirements of high-power and compute-intensive applications, including AI server power supplies, solar inverters, uninterruptible power supplies (UPS), Class D audio amplifiers, motor drives, and solid-state circuit breakers. For these critical systems, the devices provide the required reliability and performance.



Infineon's new CoolSiC G2 400V MOSFET.

Compared to existing silicon technologies in the 250V and 300V voltage classes, CoolSiC G2 400V and 440V MOSFETs achieve up to 50% lower conduction losses at an operating temperature of 120°C, thanks to their flat $R_{(DS(on)}$ as a function of junction temperature (T_j). They also feature significantly improved switching figures of merit, resulting in at least five times lower reverse recovery charge. At the system level, CoolSiC G2 400V and 440V MOSFETs in a three-stage flying-capacitor CCM totem-pole PFC achieved up to 0.4 percentage points higher peak power supply unit (PSU) efficiency compared with a state-of-the-art interleaved two-level CCM totem-pole PFC. This translates into approximately 15% lower system losses at peak efficiency.

The CoolSiC MOSFET 400V and 440V G2 portfolio is available now.

www.infineon.com/coolsic-400v

Infineon debuts 100V automotive-qualified GaN transistors

Firm supplying samples of pre-production product range for CoolGaN Automotive Transistor 100V G1 family

Infineon Technologies AG of Munich, Germany is introducing its first gallium nitride (GaN) transistor family qualified to the Automotive Electronics Council (AEC) standard for automotive applications.

For the CoolGaN Automotive Transistor 100V G1 family, Infineon has started supplying samples of its pre-production product range qualified for automotive applications in accordance with AEC-Q101, including high-voltage (HV) CoolGaN Automotive Transistors and bidirectional switches. The firm says this reinforces its commitment to providing solutions that meet the evolving needs of the automotive industry – from low-voltage infotainment systems addressed by the new 100V GaN transistor to future HV product solutions in onboard chargers and traction inverters.

"Infineon will advance its world-leading position for semiconductor solutions in the automotive industry by bringing GaN power technology to the growing software-defined and electric vehicle market," says Johannes Schoiswohl, head of the GaN business line at Infineon. "Our 100V GaN auto transistor solutions and the upcoming portfolio extension into the high-voltage range are an important milestone in the development of energy-efficient and reliable power transistors for automotive applications."

Infineon's new CoolGaN Automotive Transistor 100V G1 family.

Automotive features such as advanced driver assistance systems (ADAS), new climate control and infotainment systems require higher power and more efficient power conversion solutions while minimizing strain on the battery. Therefore, demand is growing for compact and efficient power supply solutions that are highly enabled by gallium nitride. GaN power devices offer higher energy efficiency in a smaller form factor and lower system cost compared to traditional silicon-based components.

Particularly with the shift from 12V to 48V systems in software-defined vehicles, GaN- based power conversion systems allow for improved performance but also enable advanced features such as steer-by-wire and real-time chassis control, improving ride comfort and handling. Featuring high efficiency in space-saving size, Infineon's new family of 100V CoolGaN transistors is suitable for applications such as zone control & main DC–DC converters, high-performance auxiliary systems, and Class D audio amplifiers.

www.infineon.com/gan

Infineon's CoolGaN power transistors incorporated into Universal Microelectronics' 250W adapter for networking PoE applications

Infineon is providing CoolGaN power transistors to Taiwan-based Universal Microelectronics Co Ltd (UMEC) for its new 250W adapter for networking Power over Ethernet (PoE) applications.

Infineon says that its CoolGaN transistors are helping UMEC to develop safer and more energy-efficient technology to address modern power system challenges. These solutions are suitable for power electronics across various industries including telecoms, industrial electronics, medical technology, and consumer electronics.

"This collaboration demonstrates the potential of GaN to revolutionize the data-center industry, enabling smaller, more efficient, and reliable power solutions," says Johannes Schoiswohl, head of Infineon's GaN business line.

"Partnering with Infineon and utilizing their CoolGaN power transistors in our new 250W adapter has allowed us to create a product that delivers exceptional efficiency and reliability," says Richard Lin, Power Supply product manager at Universal Microelectronics.

UMEC's 250W adapter offers efficiency of 95%, a power density increase of about 39%. The CoolGaN transistors reduce power losses, enable switching at frequencies above 200kHz, and improve thermal behavior, which is critical for compact and high-density power supplies. These are said to be critical performance improvements in the global virtual networking market, which is expected to rise at a compound annual growth rate (CAGR) of 26.5% from $48.6bn in 2024 to about $200bn by 2030, according to Grand View Research.

www.umec.com.tw

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Infineon supporting NVIDIA's 800VDC power architecture

Silicon carbide, gallium nitride and silicon combine for better efficiency and serviceability in future AI data centers

Infineon Technologies AG of Munich, Germany says that it is supporting the 800V direct current (VDC) power architecture announced by NVIDIA of Santa Clara, CA, USA at Computex 2025 for AI infrastructure.

The exponential growth of artificial intelligence is rapidly outstripping the capacity of the existing 54V data-center power infrastructure, Infineon notes. A shift to a centralized 800VDC architecture allows reduced power losses, higher efficiency and reliability. However, the new architecture requires new power conversion solutions and safety mechanisms to prevent potential hazards and costly server downtimes due to, for example, service and maintenance.

"There is no AI without power. That's why we are working with NVIDIA on intelligent power systems to meet the power demands of future AI data centers while providing a serviceable architecture that reduces system downtimes to a minimum," says Adam White, division president Power & Sensor Systems at Infineon. "By driving the transformation towards high-density, reliable and safe 800V-powered data centers, we are revolutionizing the way power is delivered to AI server racks. It's our vision to maximize the value of every watt, ultimately paving the way for a more efficient and sustainable AI ecosystem."

AI data-center operators are investing heavily in high-performance computing for artificial intelligence, with projects like Stargate requiring massive capital expenditure (CapEx) of billions of dollars, notes Infineon. To guarantee a strong return on invest, it is crucial to maximize the uptime of AI server racks, which mandates a modular and scalable scheme for serviceability. Infineon and NVIDIA are collaborating on safety and service aspects such as the hot-swap controller functionality, which enables future server boards to operate in 800VDC power architectures. Exchanging server boards on an 800VDC bus while the entire rack continues operating requires a controlled pre-charging and dis-charging of the board. Infineon is supporting this with a dedicated solution based on silicon carbide (SiC). Enabled by CoolSiC JFET technology, data-center operators can exchange server boards in an 800VDC architecture while other servers continue to operate in the same rack. This mitigates the risk of downtimes and enables safe maintenance of server racks.

Enabled by the CoolSiC JFET technology from Infineon data-center operators can exchange server boards in an 800VDC architecture while other servers continue to operate in the same rack.

The switch to an 800V direct current architecture is a major step forward to establishing powerful AI gigafactories. The power consumption of an AI server rack is forecasted to increase from about 120kW to 500kW, then to 1MW by the end of the decade. As announced in May, Infineon will collaborate with NVIDIA on developing advanced power conversion solutions for accelerated computing platforms powered by 800VDC. Infineon is leveraging its Intermediate Bus Converter (IBC) technology and high-frequency switching solutions based on gallium nitride (GaN) to accelerate the development of three- and two-stage conversion solutions from grid to core. Both approaches aim to provide the most suitable solution for data-center operators reaching efficiency levels as high as 98% per conversion stage.

As the cost of an AI server is as much as 30 times higher than a traditional server, reducing power losses and ensuring high service uptime are key levers to reducing total cost of ownership and minimizing the carbon footprint of the AI data center. Therefore, Infineon is providing full systems solutions including hot-swap controllers, reliable protection technology and highly efficient power conversion solutions based on all relevant semiconductor materials to enable efficient, safe and sustainable operation of megawatt-scale AI server racks.

Infineon Technologies' fellow Gerald Deboy gave a presentation at the OCP Global Summit 2025 in San Jose, CA, USA on 15 October in the session 'Power Conversion Solutions for future Server Boards operating directly from HV DC'. Also, powering AI data centers is being discussed at Infineon's technology collaboration forum OktoberTech Silicon Valley 2025 on 16 October.

www.nvidia.com
www.infineon.com

ROHM publishes white paper on power solutions for next-generation 800VDC architecture

Firm aligned with 800VDC roadmap to enable Gigawatt-scale AI infrastructure

Japan-based power semiconductor firm ROHM has released a new white paper detailing power solutions for AI data centers based on the 800VDC architecture of NVIDIA of Santa Clara, CA, USA.

As part of the collaboration announced in June, the white paper outlines optimal power strategies that support large-scale 800VDC power distribution across AI infrastructure.

The 800VDC architecture represents a highly efficient, scalable power delivery system poised to transform data-center design by enabling gigawatt-scale AI factories, notes ROHM. The firm offers a portfolio of power devices, including silicon (Si), silicon carbide (SiC), and gallium nitride (GaN), and says that it is among the few companies globally with the technological expertise to develop analog ICs (control and power ICs) capable of maximizing device performance.

Included in the white paper are ROHM's power solutions spanning a wide range of power devices and analog IC technologies, supported by thermal design simulations, board-level design strategies, and real-world implementation examples.

Key highlights of the white paper are cited as:

- Rising rack power consumption: Power demand per rack in AI data centers is rapidly increasing, pushing conventional 48V/12V DC power supply systems to their limits.
- Shift to 800VDC: Transitioning to an 800VDC architecture significantly enhances data-center efficiency, power density and sustainability.
- Redefined power conversion: In the 800VDC system, AC–DC conversion (PSU), traditionally performed within server racks, is relocated to a dedicated power rack.
- Essential role of SiC and GaN: Wide-bandgap devices are critical for achieving efficient performance. With AC–DC conversion moved outside the IT rack, higher-density configurations inside the IT rack can better support GPU integration.
- Optimized conversion topologies: Each conversion stage — from AC to 800VDC in the power rack and from 800VDC to lower voltages in the IT rack — requires specialized solutions. ROHM's SiC and GaN devices contribute to higher efficiency and reduced noise while decreasing the size of peripheral components, significantly increasing power density.
- Breakthrough device technologies: ROHM's EcoSiC series offers what is claimed to be industry-leading low on-resistance and top-side cooling modules ideal for AI servers, while the EcoGaN series combines GaN performance with proprietary analog IC technologies, including Nano Pulse Control. This allows for stable gate drive, ultra-fast control, and high-frequency operation — features that have earned strong market recognition.

The shift to 800VDC infrastructure is a collective industry effort. ROHM says that it is working closely with NVIDIA, data-center operators, and power system designers to deliver essential wide-bandgap semiconductor technologies for next-generation AI infrastructure. Through strategic collaborations, including a 2022 partnership with Delta Electronics, ROHM says that it continues to drive innovation in SiC and GaN power devices, enabling powerful, sustainable and energy-efficient data-center solutions.

www.rohm.com

Navitas supporting 800VDC power architecture for NVIDIA's next-gen AI factory computing platforms

Navitas unveils new 100V GaN FETs, alongside 650V GaN and high voltage SiC devices, for NVIDIA's 800VDC AI factory architecture

Navitas Semiconductor Corp of Torrance, CA, USA has announced progress in its development of medium- and high- 800VDC voltage GaN and SiC power devices to enable the 800VDC power architecture announced by NVIDIA for AI factory computing platforms.

With the emergence of the AI factory, a new class of data centers purpose-built for large-scale, synchronous AI and high-performance computing (HPC) workloads has introduced a set of power challenges, notes Navitas. Traditional enterprise and cloud data centers, which rely on legacy 54V in-rack power distribution, are no longer able to meet the multi-megawatt rack densities required by today's accelerated computing platforms. These challenges call for a fundamental architectural shift, it adds.

800VDC power distribution provides:

- higher efficiency by reducing resistive losses and copper usage;
- scalable infrastructure to deliver MW-scale rack power with highly compact solutions;
- global alignment with the IEC's low-voltage DC (LVDC) classification (≤1500VDC);
- simplified power distribution with efficient thermal management.

The 800VDC architecture enables direct conversion from 13.8kVAC utility power to 800VDC within the data-center power room or perimeter. By using solid-state transformers (SSTs) and industrial-grade rectifiers, this approach eliminates multiple traditional AC/DC and DC/DC conversion stages, maximizing energy efficiency, reducing losses, and improving overall system reliability.

The 800VDC distribution directly powers IT racks, eliminating the need for added AC–DC conversion stages, and is stepped down through two high-efficiency DC–DC stages (800VDC to 54V/12VDC, and then to point-of-load GPU voltages), to drive advanced infrastructure such as the NVIDIA Rubin Ultra platform.

These AI factories demand unprecedented levels of power density, efficiency and scalability, which can be enabled by Navitas' high-performance GaNFast and GeneSiC technologies.

As a pure-play wide-bandgap power semiconductor company, Navitas says that it delivers GaN and SiC technologies that enable high-efficiency and high-power-density power conversion across every stage of the AI data center, from the utility grid to the GPU.

Navitas says that its new 100V GaN FET portfolio delivers superior efficiency, power density and thermal performance in advanced dual-sided cooled packages. These FETs are specifically optimized for the lower-voltage DC–DC stages on GPU power boards, where ultra-high density and thermal management are critical to meet the demands of next-generation AI compute platforms. Samples, datasheets and evaluation boards are available for qualified customers.

Additionally, these high-efficiency 100V GaN FETs are fabricated on a 200mm GaN-on-silicon process through a new strategic partnership with Taiwanese foundry Powerchip Semiconductor Manufacturing Corp (PSMC), enabling scalable, high-volume manufacturing.

Navitas' 650V GaN portfolio includes a new line of high-power GaN FETs, alongside GaNSafe power ICs, which integrate control, drive, sensing and built-in protection features. This ensures what is said to be exceptional robustness and reliability, supporting the demanding performance and safety requirements of next-generation AI infrastructure.

The GaNSafe platform features ultra-fast short-circuit protection (maximum 350ns response), 2kV ESD protection on all pins, elimination of negative gate drive, and programmable slew-rate control. All these features are controlled with 4-pins, allowing the package to be treated like a discrete GaN FET, requiring no V_{CC} pin.

Enabled by over 20 years of SiC innovation, GeneSiC proprietary 'trench-assisted planar' provides what is claimed to be exceptional performance over temperature, delivering high-speed, cool-running operation for high-power, high-reliability applications. GeneSiC technology is said to offer the industry's broadest voltage range, spanning from 650V to 6500V, and has been implemented in multiple megawatt-scale energy storage and grid-tied inverter projects, including teaming with the US Department of Energy.

"As NVIDIA drives transformation in AI infrastructure, we're proud to support this shift with advanced GaN and SiC power solutions that enable the efficiency, scalability and reliability required by next-generation data centers," says Navitas' president & CEO Chris Allexandre. "As the industry moves rapidly toward megawatt-scale AI computing platforms, the need for more efficient, scalable and reliable power delivery becomes absolutely critical. The transition from legacy 54V architectures to 800VDC is not just evolutionary, it's transformational," he adds. "Navitas is undergoing a fundamental transformation, driven by the convergence of GaN and SiC technologies to power the world's most advanced systems. From grid to GPU, our focus now extends far beyond mobile, as we address the megawatt-scale demands of AI factories, smart energy infrastructure, and industrial platforms with differentiated, high-performance power solutions."

www.navitassemi.com

EPC develops power converter for 800VDC architecture in AI data centers

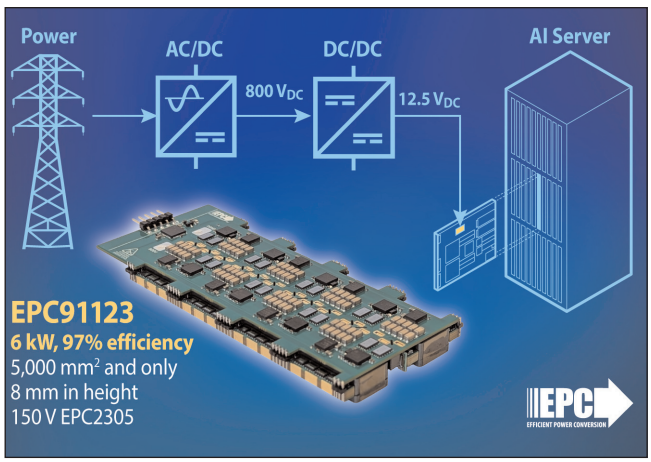
Low-cost, low-profile GaN-based 6kW 800V-to-12.5V converter based on ISOP topology

Efficient Power Conversion Corp (EPC) of El Segundo, CA, USA — which makes enhancement-mode gallium nitride on silicon (eGaN) power field-effect transistors (FETs) and integrated circuits for power management applications — is developing power converters to accelerate the adoption of 800VDC distribution systems for the next generation of AI data centers.

Future AI factory data centers will require megawatt-scale rack power delivery systems, notes EPC. To address this challenge, it has developed a low-cost, low-profile GaN-based, 6kW 800V-to-12.5V converter based on an input series output parallel (ISOP) topology.

Benefits of a GaN-based solution are cited as:

- Higher power density — occupies an area of less than 5000mm^2 and only 8mm in height, making it suitable for space-constrained AI boards;
- High efficiency and reduced losses — efficiently converts 800VDC to 12.5VDC close to the load, which reduces bussing losses and improves the system-level efficiency.



Future-proofing AI infrastructure with 800VDC

By moving from AC directly to 800VDC at the rack level, and then stepping down to 12.5V at the board, EPC says that its GaN-based solution eliminates unnecessary conversion stages and enables the scalability, simplicity and energy optimization demanded by future AI data centers.

"GaN is an essential technology for the 800VDC ecosystem," says CEO Alex Lidow. "Our collaboration with NVIDIA is to develop compact, efficient, cost-effective board-level conversion to power future AI factories at gigawatt scale."

www.epc-co.com

ST unveils prototype power delivery system for NVIDIA's 800VDC power architecture

Firm combining SiC, GaN and silicon technologies and custom design at chip and package levels

STMicroelectronics of Geneva, Switzerland has unveiled a complete prototype of its new power delivery system as it develops new chip designs supporting the 800VDC power architecture announced by NVIDIA of Santa Clara, CA, USA for next-generation AI data centers.

The rapid growth of AI workloads is creating unprecedented power demands in data centers, notes ST. Traditional 54V power distribution systems, designed for kilowatt-scale racks, are insufficient for the needs of emerging megawatt-scale AI compute racks. To address this, NVIDIA is working with the ecosystem on the 800VDC power architecture, which supports megawatt-scale compute racks while improving efficiency, reducing copper usage, and simplifying infrastructure.

ST says that it is actively developing the essential chip technologies for 800VDC architectures, leveraging its diverse power chip portfolio that combines silicon carbide (SiC), gallium nitride (GaN) and silicon technologies and advanced custom design at both the chip and package levels.

At the 2025 OCP Global Summit in San Jose, CA, USA, ST shared a key milestone with the development of a compact 12kW power delivery board that is approximately the size of a smartphone. The 12kW GaN-based LLC converter, operating at an 800V input and a 1MHz switching frequency, has successfully completed full-power testing, delivering continuous 12kW output power with over 98% efficiency and a power density exceeding 2600W/in_ at 50V.

The solution addresses the fundamental challenges of power density, efficiency, thermal management, and reliability, which are essential for deploying megawatt-scale AI compute racks while reducing infrastructure complexity and total ownership costs.

www.nvidia.com
www.st.com

AOS supporting 800VDC power architecture

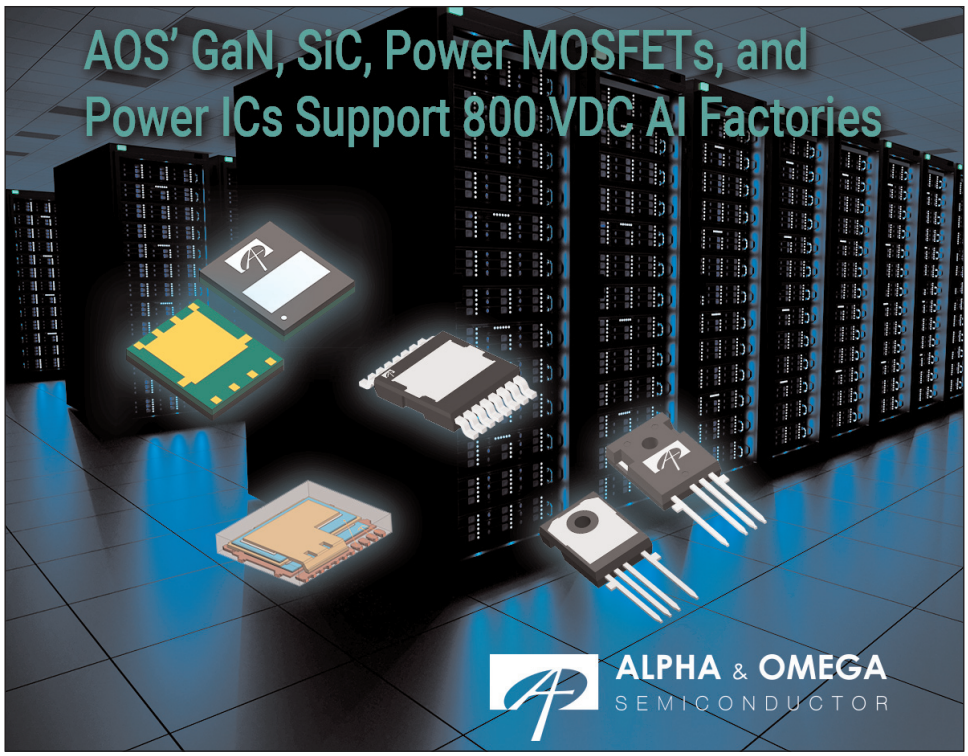
SiC and GaN, power MOSFET and power IC solutions aligned with technical demands of next gen AI factories

Alpha and Omega Semiconductor Ltd (AOS) of Sunnyvale, CA, USA (which designs and develops discrete power devices, wide-bandgap power devices, power management ICs and modules) says that it is supporting the power requirements of the 800 VDC architecture announced by NVIDIA of Santa Clara, CA, which is set to power the next generation of AI data centers, featuring megawatt-scale racks to meet the exponential growth of AI workloads.

The shift from traditional 54V power distribution to an 800VDC system is a fundamental change in data-center design, aimed at overcoming the physical limits of existing infrastructure. By reducing power conversion steps and enabling more efficient power delivery, the 800VDC architecture promises significant efficiency gains, reduced copper usage, and improved reliability. This paradigm shift requires power semiconductors, particularly silicon carbide (SiC) and gallium nitride (GaN), to handle the higher voltages and frequencies with maximum efficiency.

"As a key supplier to the high-performance data-center market, our portfolio of SiC and GaN products is strategically aligned with the core technical demands of next generation AI factories with 800VDC power architecture," says Ralph Monteiro, senior VP, Power IC and Discrete product lines at AOS. "We are collaborating with NVIDIA to design 800VDC power semiconductors to provide the high efficiency and power density necessary for the new power distribution modules, from the initial AC-to-DC conversion to the final DC-to-DC stages within the racks."

AOS reckons that its expertise in developing and manufacturing wide-bandgap (WBG) semiconductors positions it as a strong enabler for this transition, since its products



are suited to the crucial power conversion stages highlighted in the next-generation AI factory 800VDC power architecture:

- **High-voltage conversion**: AOS' SiC devices (including the Gen3 AOM020V120X3 or topside-cooled AOGT020V120X2Q) are said to offer superior voltage handling and low losses, making them suitable for either the power sidecar configuration or the single-step conversion of 13.8kV AC grid power directly to 800VDC at the data-center perimeter. This simplifies the power chain and enhances overall system efficiency.
- **High-density DC-DC conversion**: Within the racks, AOS' 650V GaN FETs (like the upcoming AOGT035V65GA1) and 100V GaN FETs (like the AOFG018V10GA1) provide the required density essential for converting the 800VDC power to the lower voltages needed by GPUs. Their high-frequency switching capabilities allow for smaller, lighter converters, freeing up valuable space for more compute resources and improving cooling efficiency.
- **Packaging innovations**: AOS' 80V, 100V stacked-die MOSFETs (like the AOPL68801) and 100V GaN FETs share a common package footprint, allowing designers to trade off cost and efficiency in the secondary side of LLC topologies and also in 54V-to-12V bus converters. AOS' innovative stacked die packages enable next-level power density for the secondary-side LLC socket.
- **Multi-phase controllers**: AOS also offers high-performance, multi-rail 16-phase controllers for the 54V-to-12V and further downstream conversion stages to the AI SoC.

AOS says that, by providing these foundational power technologies, it is helping to advance the benefits of the 800VDC architecture, including up to a 5% boost in end-to-end efficiency, a 45% reduction in copper requirements, and a significant cut in maintenance and cooling costs, reinforcing AOS' commitment to enabling the creation of more sustainable and scalable AI infrastructure.

www.aosmd.com

Power Integrations details 1250V and 1700V PowiGaN technology for 800VDC AI data centers

White paper shows advantages versus 650V GaN and 1200V SiC

Power Integrations Inc of San Jose, CA, USA (which provides high-voltage integrated circuits for energy-efficient power conversion) has outlined the benefits of its PowiGaN gallium nitride technology for next-generation AI data centers. The capabilities of 1250V and 1700V PowiGaN technology for 800VDC power architectures are explained in a new white paper from Power Integrations, published at the 2025 OCP Global Summit in San Jose, where NVIDIA provided an update on the 800VDC architecture. Power Integrations is collaborating with NVIDIA to accelerate the transition to 800VDC power and megawatt-scale racks.

The new white paper details the performance advantages of Power Integrations' 1250V PowiGaN HEMTs, illustrating their field-proven reliability and their ability to meet the power density and efficiency requirements (>98%) of the 800VDC architecture. Further, the paper demonstrates that a single 1250V PowiGaN switch delivers greater power density and efficiency compared to stacked 650V GaN FETs and competing 1200V silicon carbide (SiC) devices.

The white paper also highlights Power Integrations' InnoMux2-EP ICs as a solution for auxiliary power supplies in 800VDC data centers. The InnoMux-2 device's integrated 1700V PowiGaN switch supports 1000VDC input voltage, while its SR ZVS operation provides greater than 90.3% of 12V system efficiency in a liquid-cooled, fan-less 800VDC architecture.

"With rising AI power demands, moving to an 800VDC input simplifies rack design, makes more efficient use of space and reduces copper usage," says Roland Saint-Pierre, VP of product development. "With rising rack power demands, we see 1250V and 1700V PowiGaN devices as ideal choices for main and auxiliary power supplies, delivering the efficiency, reliability and power density required in 800VDC data centers."

www.power.com/ai-data-center

Power Integrations' CFO Sandeep Nayyar leaves firm

Senior director of finance Eric Verity serving as interim CFO

Power Integrations says that Sandeep Nayyar (its chief financial officer since 2010) left the firm, effective 4 October, to pursue a new opportunity.

Senior director of finance Eric Verity (a veteran member of the finance leadership team) is serving as interim CFO while the firm searches for a new CFO. Additionally, the company reaffirmed the third-quarter financial outlook it provided on 6 August.

"Sandeep has played a vital role on our senior leadership team over the past 15 years," comments president & CEO Jennifer Lloyd. "Thanks to his expert stewardship, Power Integrations has a strong financial foundation to build upon as we execute our growth strategy," he adds.

"I am incredibly proud of all that our finance and HR teams have accomplished during my tenure," says Nayyar. "I leave knowing that Power Integrations is on very solid financial footing, with an extremely capable new leader in Jen Lloyd."

Renesas' GaN-based power devices supporting NVIDIA's 800V direct current power architecture

Power conversion and distribution solutions enable smarter, faster AI data-center architecture

Renesas Electronics Corp of Tokyo, Japan says that it is supporting efficient power conversion and distribution for the 800V direct current power architecture announced by NVIDIA of Santa Clara, CA, USA, helping to fuel the next wave of smarter, faster AI infrastructure.

As GPU-driven AI workloads intensify and data-center power consumption scales into multi-hundred megawatt territory, modern data centers must adopt power architectures that are both energy optimized and scalable, notes Renesas. Wide-bandgap semiconductors such as gallium nitride (GaN) FET switches are quickly emerging as a key solution due to their faster switching, lower energy losses, and superior thermal management. Moreover, GaN power devices will enable the development of 800V direct current buses within racks to significantly reduce distribution losses and the need for large bus bars, while still supporting the reuse of 48V components via DC/DC

step-down converters.

Renesas says that its GaN-based power solutions are especially suited for the task, supporting efficient and dense DC/DC power conversion with operating voltages of 48V to as high as 400V, with the option to stack up to 800V. Based on the LLC direct current transformer (LLC DCX) topology, these converters achieve up to 98% efficiency. For the AC/DC front-end, Renesas uses bi-directional GaN switches to simplify rectifier designs and increase power density. Renesas REXFET MOSFETs, drivers and controllers complement the bill-of-materials (BOM) of the new DC/DC converters.

"AI is transforming industries at an unprecedented pace, and the power infrastructure must evolve just as quickly to meet the explosive power demands," says Zaher Baidas, senior VP & general manager of Power at Renesas. "Renesas is helping power the future of AI with high-density energy solutions built for scale, supported by our full portfolio of GaN FETs, MOSFETs, controllers and drivers. These innovations will deliver performance and efficiency, with the scalability required for future growth."

Renesas has published a white paper that explores the topology of its devices supporting 800V power distribution in AI infrastructure.

www.renesas.com/en/products/power-management

Filtronic unveils Cerus V GaN solid-state power amplifier

Filtronic plc of Sedgefield and Leeds, UK — which designs and manufactures RF and millimeter-wave (mmWave) transmit & receive components and subsystems — launched the latest development in solid-state power amplifiers (SSPAs) operating in the V-band. The Cerus V was showcased alongside its Cerus W solid-state power amplifiers at European Microwave Week (EuMW 2025) in Utrecht, the Netherlands (21–26 September).

With "unrivalled" high-frequency power, the Cerus V is designed for high-reliability mission-critical satellite uplinks (for low Earth orbit) and advanced RF applications with scalability and modular redundancy.

The system represents a step-change for Filtronic, introducing its latest gallium nitride technology to Cerus 32 solid-state power amplifiers. Building on decades of expertise in high-performance, mission-critical mmWave solutions, the new GaN-enabled platform delivers flexible, scalable deployment for the most demanding applications.

The established Cerus range will operate in the high-bandwidth 47.2–52.4GHz range. Cerus V supports a full 5.2GHz bandwidth and delivers saturated output power up to 50dBm (100W).

Also, the platform can expand from single units to multi-module format, featuring built-in redundancy and graceful degradation modes to maintain operation under fault conditions.

"As demand for high-frequency, high-power RF solutions accelerates across space, defence and telecoms, our Cerus amplifiers set a new benchmark for what's possible," says chief commercial officer Antonino Spatola. "Each platform is engineered not only for exceptional performance but also for the flexibility, reliability and scalability that long-term, mission-critical applications demand. From satellite ground-stations to next-generation high-frequency networks, Cerus sub-systems equip engineers with the power and resilience to meet the toughest challenges."

www.filtronic.com

NOVOSENSE, UAES and Innoscience cooperating on power electronics for electric vehicles

Analog and mixed-signal IC design to combine with GaN device technology and automotive system integration

Chinese automotive semiconductor supplier NOVOSENSE Microelectronics, China's largest tier-1 automotive supplier United Automotive Electronic Systems Co Ltd (UAES, a joint venture established in 1995 by China's Zhonglian Automotive Electronics Co Ltd and Germany's Robert Bosch GmbH) and Inno-Science (Suzhou) Technology Holding Co Ltd — which manufactures gallium nitride (GaN) power chips on 8" silicon wafers — have signed a strategic cooperation agreement to jointly advance power electronics for new energy vehicles (NEVs).

The three parties will collaborate on the development of next-generation intelligent integrated GaN products. Building on their combined expertise, the new devices should deliver more reliable GaN driving and protection features, enabling higher power density and paving the way for commercial adoption across the automotive industry.

Signing ceremony for the strategic cooperation agreement.

Complementary strengths and shared goals

Through joint R&D and application validation, NOVOSENSE, UAES and Innoscience will tackle critical challenges such as efficiency, reliability and cost. Together, the three parties aim to deliver solutions that combine high performance with competitive economics. NOVOSENSE has expertise in high-performance analog and mixed-signal IC design. UAES contributes knowledge in system integration and automotive applications. Innoscience adds competence in GaN device technology. This cross-disciplinary collaboration should establish a platform for innovation across the value chain, aiming to accelerate GaN adoption in next-generation automotive systems.

"GaN technology is a vital enabler for vehicle electrification," notes UAES' deputy general manager Dr Xiaolu Guo. "Partnering with NOVOSENSE and Innoscience allows us to integrate capabilities from device to system level, driving GaN industrialization and delivering efficient, reliable and cost-effective solutions for our customers," he adds.

"Upgrading the NEV industry requires deep collaboration across the value chain," says NOVOSENSE's founder, chairman & CEO Shengyang Wang. "By combining UAES's system integration expertise with Innoscience's GaN leadership and NOVOSENSE's IC design capabilities, we are creating a powerful synergy. This strategic partnership sets a benchmark for industry collaboration, ensuring both technological breakthroughs and market value creation," he believes.

"The potential of GaN in automotive power electronics is only beginning to be realized," says Innoscience's CEO Dr Jingang Wu. "True impact will come from aligning device innovation with system requirements," he adds. "We look forward to working closely with NOVOSENSE and UAES to extend the boundaries of GaN applications in automotive electrification and to translate technological advantages into tangible industry benefits."

www.uaes.com
www.innoscience.com

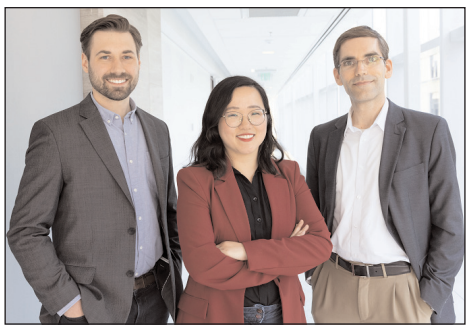
MIT-spinout Vertical Semiconductor raises $11m in seed funding round led by Playground Global

Vertical GaN power conversion technology to reduce heat, shrink power system footprint, and lower energy costs in AI infrastructure

Massachusetts Institute of Technology (MIT) spin-out Vertical Semiconductor has raised $11m in a seed funding round led by Playground Global of Palo Alto, CA, USA to help accelerate development of vertical gallium nitride (GaN) transistors for AI chips in data centers. Additional investors include JIMCO Technology Ventures, milemark•capital, and Shin-Etsu Chemical.

The surge of AI workloads is straining data centers, and power delivery has become the critical bottleneck, notes Vertical. The firm says that its vertical GaN transistors can ease that bottleneck by pushing energy conversion closer to the chip with less power loss and heat, which is critical for powering the future of compute. This reduces energy loss, cuts heat, and simplifies infrastructure, improving efficiency by up to 30% and enabling a 50% smaller power footprint in AI data-center racks, it is reckoned.

"The pace of AI is not only limited by algorithms. The most significant bottleneck in AI hardware is how fast we can deliver power to the silicon," says CEO & co-founder Cynthia Liao. "We're not just improving efficiency, we're enabling the next wave of innovation by rewriting how electricity is delivered in data centers at scale."



MIT-spinout Vertical Semiconductor's founders Dr Josh Perozek, Cynthia Liao, and professor Tomás Palacios.

Based on a decade of research at MIT's Palacios Group (a gallium nitride research lab) and combined with a novel vertical architecture, Vertical's transistors can make it easier, faster and more efficient to get power from the source to the chip, compared with silicon transistors. Vertical Semiconductor has demonstrated the technology on 8-inch wafers using standard silicon CMOS semiconductor manufacturing methods, enabling seamless integration with existing process technology and making it ready for real-world deployment for devices from 100V to 1.2kV.

"The Vertical team has cracked a challenge that's stymied the industry for years: how to deliver high-voltage and high-efficiency power electronics with a scalable, manufacturable solution," comments Matt Hershenson, venture partner at Playground Global. "They're not just advancing the science – they're changing the economics of compute."

With a prototype in development and commercial milestones ahead, the firm plans to start early sampling for its first prototype packaged devices by the end of 2025 and a fully integrated solution in 2026.

www.playground.vc
www.verticalsemi.com

RTX unveils APG-82(V)X radar enhanced with GaN

US-based Raytheon (a business of aerospace & defense company RTX of Arlington, VA) has unveiled the APG-82(V)X as the latest iteration of its combat-proven APG-82 radar. The new radar variant incorporates gallium nitride (GaN) technology to enhance its effectiveness, delivering increased range, advanced air-to-air, air-to-ground and electronic warfare capabilities.

APG-82(V)X enables faster target detection, tracking and engagement with multi-function fire control and electronic warfare capabilities.
As an advanced active electronically scanned array radar, it uses thousands of transmit and receive modules, which enable the radar to rapidly switch between transmitting and receiving signals, providing greater reliability and more precise targeting against aerial threats like cruise missiles, drones and modern fighter aircraft.

"The enhanced capability of this next-generation radar enables aircrew to detect and engage threats at longer ranges than ever before, providing a crucial first-look, first-shoot advantage," says Dan Theisen, president of Advanced Products and Solutions at Raytheon.
"As the threat environment evolves, this new radar will ensure faster decision making and superior situational awareness in contested environments."

The APG-82(V)X radar incorporates GaN technology, which provides greater range without needing additional power. It is scalable and built with open architecture standards, with next-generation technology and improved processor speed, providing significantly increased capability to current- and future-generation aircraft.

Development of the radars has begun in El Segundo, California, and production of the radars will leverage mature production lines in Forest, Mississippi.

www.rtx.com/raytheon

CGD partners with GlobalFoundries to supply single-chip ICeGaN power devices

CGD design flow to be applied to GF process design kit

Fabless company Cambridge GaN Devices Ltd (CGD) — which was spun out of the University of Cambridge in 2016 to design, develop and commercialize power transistors and ICs that use GaN-on-silicon substrates — is working GlobalFoundries of Malta, NY (GF, the only US-based pure-play foundry with a global manufacturing footprint, including facilities in the USA, Europe and Singapore). The partnership strengthens CGD's fabless strategy, expanding the supply chain for its ICeGaN power devices.

CGD's single-chip technology runs with standard silicon MOSFET drivers and is built using a standard silicon CMOS wafer fab process. So, there is no need for a specialist process in the wafer fab, and leveraging GF's 8" process ensures that the manufacturing costs of CGD products remain inherently competitive.

ICeGaN IP is design- rather than process-based, so it is fab-agnostic and hence easily transferrable to new foundries. Furthermore, the CGD design flow has been built on years of experience in GaN technology and enables fast fab process porting through a proven methodology. Advanced machine learning algorithms are applied to proprietary test chip characterization data to refine the models, enabling the timely delivery of CGD's newest products with reliable and predictable performance. This capability ensures 'right first time' designs that enable ICeGaN power devices to be brought to market in less time, claims CGD, providing it with the agility to innovate and respond quickly to the changing application landscape.

"Applying the CGD design flow to the excellent GF process design kit (PDK) is essential to enabling CGD to develop and manufacture our next-generation GaN power devices at a much faster time to market," says chief operating officer Simon Stacey. "We are delighted to be partnering with GF, as their renowned foundry services and commitment to GaN are a perfect fit for our ICeGaN power devices."

GaN offers unique advantages including higher efficiency, higher power density, compact in size with faster switching speeds. This enables power electronics designers to develop sustainable, energy-efficient systems. These inherent benefits, coupled with the flexibility of the proven fabless model, mean that CGD believes it is positioned to take advantage of rapidly growing markets, which can already be seen in the growing demand for GaN technology.

Uniquely, ICeGaN combines a GaN switch, interface and protection circuitry on the same GaN chip, in contrast to most other solutions that use multi-chip or co-packaged solutions. CGD says that its integrated approach means that devices are simple to drive using standard silicon technology and are very rugged. CGD claims to be the only company worldwide with single-chip technology that can run on a standard driver, making next-generation power systems more efficient and truly scalable. This will enable design engineers to have confidence in GaN, which offers significant efficiency, size and thermal benefits over traditional silicon devices.

www.gf.com
www.camgandevices.com

Epirus' GaN-based Leonidas high-power microwave system neutralizes all 61 drones in live-fire demo

49-drone swarm defeated with one pulse of electromagnetic interference

Epirus Inc of Torrance, CA, USA says that, in an invitation-only demonstration on 26 August at Camp Atterbury, Indiana (attended by representatives from throughout the US Department of Defense, other US Government agencies and nine allied countries), its Leonidas solid-state high-power microwave (HPM) system — which uses gallium nitride (GaN) transistors to minimize size, weight and deployment time — delivered weaponized electromagnetic interference to counter swarms of robotic, asymmetric threats.

In a live-fire demonstration across five operationally relevant flight scenarios, Leonidas disabled all 61 drones. The system also defeated a 49-drone swarm consisting of two threat representative drone types, all with one instant and low-collateral pulse of high-energy electromagnetic interference.

"Leonidas is the only mission-capable, counter-swarm solution for the one-to-many fight," reckons Epirus' CEO Andy Lowery.

The event demonstrated the first generation of Leonidas, designed and developed using internal R&D funds in 2022. Epirus unveiled its latest version of Leonidas in July, which is expected to more than double the operational range and lethality in the same form factor.

www.epirusinc.com

University of Michigan develops first PEALD-grown ScAlN thin film layers on 3D surfaces

Scandium aluminium nitride can be integrated into high-voltage, high-frequency or piezoelectric devices using plasma-enhanced ALD

The first demonstration of scandium aluminium nitride (ScAlN) thin films grown by plasma-enhanced atomic layer deposition PEALD expands application to complex 3D structures, according to a University of Michigan study published in Applied Physics Letters and funded partly by the Army Research Office (W911NF-24-2-0210).

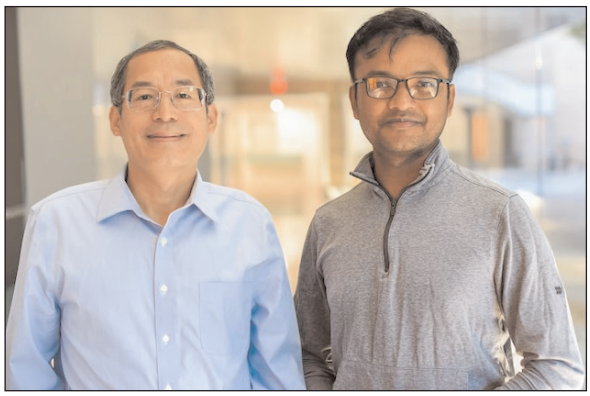
Conventional methods — such as sputtering and epitaxy — can only layer ScAlN on flat surfaces, limiting application as most devices have complex geometries. The new method allows precise control over ScAlN thickness, scandium content and uniformity at lower processing temperatures.

"This approach makes high-performance ScAlN more accessible to research labs and paves the way for integrating it into advanced devices that were previously out of reach," says Md Mehedi Hasan Tanim, a doctoral student of electrical and computer engineering and lead author of the study.

ScAlN's piezoelectric ability to generate electricity when mechanically stressed has been investigated for use in wearable energy harvesters capable of converting mechanical motion, such as walking or body movement, into usable electrical power.

As an ultrawide-bandgap material, ScAlN can also improve high-power devices like electric vehicle EV power converters, as it can handle high voltages without breaking down. High-frequency devices, like filters or amplifiers for future 5G or 6G cell phones, can also leverage ScAlN's superior piezoelectric and acoustic properties — as well as high current handling capability, which allows better signal quality and higher data rates.

But, despite the worldwide interest in ScAlN, it has remained unknown if it can be grown or synthesized by using plasma-enhanced atomic layer deposition.



Zetian Mi (left), the Pallab K. Bhattacharya Collegiate Professor of Engineering at U-M, and Md. Mehedi Hasan Tanim (right), a doctoral student of electrical and computer engineering. (Photo courtesy of Jero Lopera, Michigan Engineering).

To create ScAlN thin films, researchers use a supercycle growth approach — fine tuning the timing and ratio of aluminium nitride (AlN) and scandium nitride (ScN) layers — within a temperature range of 225–250°C.

"Each pass lays down an ultrathin, self-limiting coat and, by repeating the process, we achieve a precise, uniform film," says the study's corresponding author Zetian Mi, the Pallab K. Bhattacharya Collegiate Professor of Engineering at the University of Michigan, who is also a professor of electrical & computer engineering and materials science & engineering at U-M.

Thin films were grown on a gallium nitride/sapphire substrate — well-suited for high-power, high-frequency or piezoelectric devices. Electron microscopy confirmed that the new method allows precise control of scandium composition (0–25%) while maintaining atomically smooth surfaces.

Further, each element was evenly mixed rather than clumped, and there were few defects at the boundary between the thin film and substrate. Both properties ensure the ease of integration into existing gallium nitride devices.

Piezoelectric strength in ScAlN grown with PEALD matched those produced with conventional sputtering or epitaxy, proving that piezoelectric properties persist even when layered in different geometries.

"Going forward, we plan to explore integrating ALD-grown ScAlN into device prototypes to leverage its unique material properties and scalable processing," says Mi.

Md. Mehedi Hasan Tanim, a doctoral student of electrical and computer engineering, prepares to grow ScAlN thin films using PEALD. The method can layer ScAlN on 3D structures while previous approaches were restricted to flat surfaces, opening up new opportunities for device integration. Credit: Jero Lopera, Michigan Engineering.

The technique was developed in the Lurie Nanofabrication Facility and studied at the Michigan Center for Materials Characterization, both of which are operated and maintained with support from indirect cost allocations in federal grants.

https://ece.engin.umich.edu

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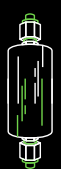
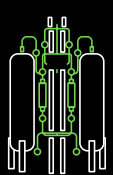
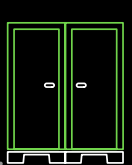


Point-of-Use Purifiers



Frame-Mounted Purifiers



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Imec launches 300mm GaN program to develop low- and high-voltage power devices and cut manufacturing costs

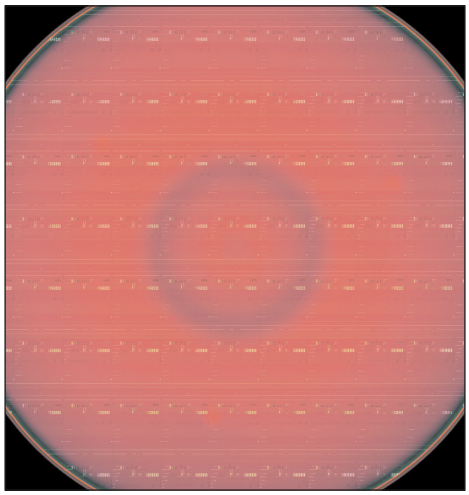
AIXTRON, GlobalFoundries, KLA, Synopsys & Veeco join as first partners

Nanoelectronics research center imec of Leuven, Belgium has welcomed AIXTRON, GlobalFoundries, KLA Corp, Synopsys and Veeco as first partners in its 300mm gallium nitride (GaN) open innovation program track for low- and high-voltage power electronics applications.

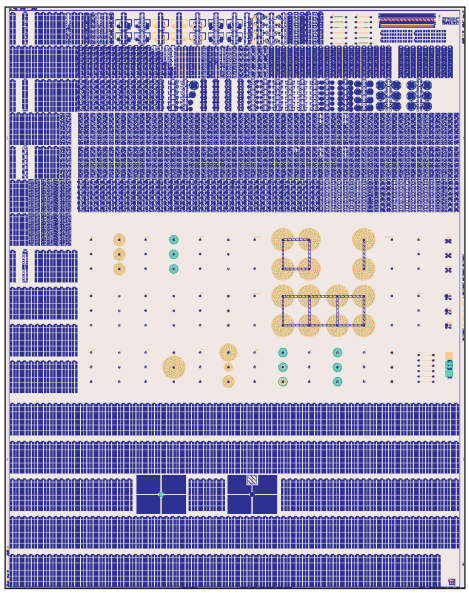
As part of imec's industrial affiliation program (IIAP) on GaN power electronics, this program track has been set up to develop 300mm GaN epi growth, and low- and high-voltage GaN high-electron-mobility transistor (HEMT) process flows. The use of 300mm substrates should not only reduce GaN device manufacturing costs but it will also allow the development of more advanced power electronics devices, such as efficient low-voltage point-of-load converters for CPUs and GPUs.

The recent market introduction of GaN-based fast battery chargers underscores the potential of GaN technology for power electronics applications, says imec. Backed by continuing progress made in GaN epi growth, GaN device and IC manufacturing, reliability and robustness, and system-level optimization, GaN technology is poised to enable a new generation of power electronics products, it adds. These will enter the market with reduced form factors, smaller weight, and superior energy conversion efficiency compared with silicon-based solutions. Examples are on-board chargers and DC/DC converters for automotive applications, inverters for solar panels, and power distribution systems for telecom and AI data centers, where GaN-based building blocks contribute to the overall decarbonization, electrification and digitalization of society.

A notable trend in GaN technology development is the move to larger wafer diameters, with capacity now mostly available on 200mm.



300mm GaN-on-Si wafer from AIXTRON inspected on 8 Series/ CIRCL tool from KLA, after p-GaN etch by imec.



Development mask set for GaN HEMTs on 300mm substrates.

With the launch of its 300mm GaN program track, imec is taking the next step, building on its 200mm expertise. "The benefits of transitioning to 300mm wafers go beyond upscaling production and reducing manufacturing costs," says Stefaan Decoutere, fellow and program director of the GaN power electronics program at imec. "Our CMOS-compatible GaN technology now has access to 300mm state-of-the-art equipment that will allow us to develop more advanced GaN-based power devices. Examples are aggressively scaled low-voltage p-GaN gate HEMTs for use in point-of-load converters, supporting energy-efficient power distribution for CPUs and GPUs."

As part of the 300mm GaN program, a baseline lateral p-GaN HEMT technology platform will first be established for low-voltage applications (100V and beyond), using 300mm Si(111) as a substrate. For this, process module work centered around p-GaN etch and Ohmic contact formation is ongoing. Later, high-voltage applications are targeted. For 650V and above, developments will utilize 300mm semi-spec and CMOS-compatible QST- engineered substrates (a material with poly-crystalline AlN core). During the developments, control over the bow of the 300mm wafers and their mechanical strength are prime concerns.

The launch of the 300mm GaN program follows successful 300mm wafer handling tests and mask-set development. Imec expects to have full 300mm capabilities installed in its 300mm cleanroom by the end of 2025. "The success of the 300mm GaN development also hinges on the ability to establish a robust ecosystem and jointly drive innovation from 300mm GaN growth and process integration to packaging solutions," says Decoutere. "We are therefore pleased to announce AIXTRON, GlobalFoundries, KLA Corp, Synopsys and Veeco as first partners in our open R&D program track on 300mm GaN and hope to welcome more partners soon, because developing advanced GaN power electronics requires close coupling between design, epitaxy, process integration and applications – a coupling that has proved to be critical for our pioneering work on 200mm GaN."

www.imec-int.com

imec's co-COO Patrick Vandenameele appointed CEO

Luc Van den hove becomes chairman after 17 years as CEO

The board of directors of nano-electronics research center imec of Leuven, Belgium has appointed Patrick Vandenameele as CEO. Effective 1 April 2026, he will succeed Luc Van den hove, who (after 17 years as CEO) will then become chair of the board.

In this new role, Van den hove will focus on executive stakeholder management and will continue to provide strategic guidance, supporting the new CEO and safeguarding imec's long-term strategy. The transition to the new leadership structure has been prepared over the past two years, ensuring a stable handover that maintains continuity in how imec collaborates with its partner community.

Vandenameele joined imec in 1996 as a researcher in wireless communication after earning his PhD in electrical engineering from KU Leuven. He went on to build an international career as a deep-tech entrepreneur, returning in 2017 to strengthen imec's venturing activities. Since 2021, he has been instrumental in shaping imec's R&D strategy, most recently as executive VP & co-chief operating officer.

Van den hove and Vandenameele.

"Imec stands at a pivotal moment where artificial intelligence and system technologies are defining the future of our industry," notes Van den hove. "Patrick possesses the right skills, the right attitude, the right values, and the precise background needed to guide imec forward. His technological vision and leadership are exactly what imec needs as we enter this new era," he adds.

"I'm looking forward to guiding an organization that is recognized internationally as a world leader in nanoelectronics and digital technologies, and a true catalyst for global innovation," comments Vandenameele. "I am grateful for Luc's guidance and the board's trust," he adds. "The opportunities at the intersection of artificial intelligence and advanced hardware are extraordinary."

www.imec-int.com

Rupert Baines made non-executive director of CSA Catapult

Tech entrepreneur to support corporate governance and inform long-term strategy

Compound Semiconductor Applications (CSA) Catapult has appointed tech entrepreneur Rupert Baines as a non-executive director, working with members of the board to support its corporate governance and to inform its long-term strategy.

Established in 2018 by government agency Innovate UK, CSA Catapult is a not-for-profit center of excellence with labs and offices across the UK that specializes in the measurement, characterization, integration and validation of compound semiconductor technology spanning power electronics, advanced packaging, radio frequency and microwave, and photonics applications.

Baines has founded several technology companies and has had three successful exits. He was CEO of UltraSoc (sold to Siemens in July 2020), CMO of Codasip, and CEO of QPT.

He is currently chair of RANsemi, chair of Cambridge Tech Week, and co-chair of the Semiconductor Expert Working Group industry body reporting to the UK Department of Science, Innovation and Technology (DSIT).

Baines currently serves as a mentor with Silicon Catalyst's ChipStart program, and is a Fellow at DeepTech Labs. He is also a trustee of the UK Electronics Skills Foundation (UKESF), which conducts several initiatives to encourage and support young people to study electronic engineering.

"I worked with compound semiconductors, specifically silicon germanium, early on in my career at Analog Devices and caught a first glimpse of how effective and powerful they can be," notes Baines. "Since then, the compound semiconductor industry has grown rapidly, and the UK has developed significant strength in this area. We have a rare combination of great research and manufacturing capability with clusters around the country doing some very exciting things," he adds.

"Rupert is an experienced and well-respected member of the UK semiconductor ecosystem who brings with him a wealth of experience from industry and business scale-up," comments CSA Catapult's chair Jonathan Flint.

"The global semiconductor landscape is evolving fast," notes interim CEO Raj Gawera. "We face a challenging mix of transformative technologies such as AI coupled with geopolitical uncertainty," he adds. "Navigating the best path for both CSA Catapult and for the wider UK semiconductor sector requires both strong experience and seasoned judgement. I'm very pleased Rupert is joining the board to strengthen the capability and help set the right direction."

www.csa.catapult.org.uk

US Critical Materials and GreenMet ally for US gallium and critical mineral independence

GreenMet to advise US Critical Materials, supporting efforts to secure federal funding

Private rare-earths exploration and process development company US Critical Materials Corp of Salt Lake City, Utah, USA has announced a strategic advisory alliance with GreenMet, a Washington DC-based firm specializing in critical minerals strategy and financing. The partnership marks a step in advancing domestic US rare-earth production, with gallium at the forefront.

US Critical Materials holds the highest-grade reported gallium deposit in the USA, with concentrations averaging 300ppm — far exceeding the 50ppm that the USA had been importing, predominantly from China. As it is essential for advanced semiconductors, defense electronics and satellite communications, gallium has been identified by the US government as a critical mineral with high supply chain vulnerability. The Sheep Creek deposit in Montana will prioritize gallium as one of the first minerals to be processed under its Phase II Cooperative Research and Development Agreement (CRADA) with Idaho National Laboratory (INL).

Consistent with an executive order by President Trump on 20 March, the parties have entered into preliminary discussions with a major Army installation base in Alabama as a site for the environmentally benign processing of rare-earth elements, critical minerals, the strategic storing of these materials, and an Innovation Center to provide critical mineral war-fighting capabilities.

Sheep Creek's mineral profile is said to be unmatched domestically, with ore grades approaching 9% total rare earths (89,932ppm) and combined neodymium and praseodymium concentrations of 2.4% (23,810ppm), as verified by the Idaho National Laboratory and by Activation Labs. The initial 2.5 square-mile site — part of a broader 11 square-mile claim — hosts over 60 carbonatite formations, underscoring its potential for high-grade, strategically vital resources.

GreenMet will serve as strategic advisor to US Critical Materials, supporting efforts to secure federal funding through grants and concessional loans aimed at strengthening US critical mineral supply chains. The engagement will be led by GreenMet's founder & CEO Drew Horn, a recognized authority in defense supply chain strategy and former senior official at the White House National Security Council, Department of Energy, and Department of Defense.

"Gallium is not just a mineral — it's a strategic asset," says Horn. "US Critical Materials is uniquely positioned to deliver high-grade gallium and rare earths from a secure domestic source, directly supporting US national security and technological independence," he adds.

"We look forward to working closely with GreenMet to help establish rare-earth and critical mineral sovereignty for the United States," says US Critical Materials' executive chairman Harvey Kaye.

The alliance reinforces US Critical Materials' commitment to building a resilient, domestic supply chain for critical minerals, with gallium as a cornerstone of its national security mission.

With substantial mineral holdings in Montana and Idaho, the firm is dedicated to securing a domestically sustainable, high-grade supply of rare-earth elements and gallium, reducing US reliance on imports, and ensuring a stable, independent supply chain for national security. It is currently utilizing and developing environmentally friendly technologies for exploration and processing of rare earths and critical minerals.

www.energy.gov
www.greenmet.com
www.uscriticalmaterials.com

Xerion to extend DirectPlate electrolysis to refining of gallium from domestic US feedstocks

Phase I SBIR award from US Defense Logistics Agency to demonstrate economic and technical feasibility

Xerion Advanced Battery Corp of Kettering, OH, USA, which develops and manufactures next-generation battery components and critical minerals, is expanding its critical minerals refinement portfolio after recently demonstrating the capability to refine gallium. Xerion aims to develop the process on a commercial scale to support military and commercial applications, including the production and maintenance of critical defense platforms, as well as semiconductors. To demonstrate the feasibility of this technology, Xerion has been awarded Phase I funding from the US Defense Logistics Agency (DLA) under the small business innovation research (SBIR) program.

With its DirectPlate electrolysis technology, originally developed for the refining and synthesis of battery components, Xerion is developing the capability to refine gallium from several existing and readily available domestic sources containing varying low-level gallium content. The technology may also provide the capability to refine high-purity germanium, depending on the resource. Xerion says that, unlike existing methods that require multiple plants and extensive processing, its DirectPlate approach can transform existing and readily available domestic ores and bauxite processing waste directly into high-purity gallium metal suitable for alloying to semiconductor-dependent materials with what is claimed to be unprecedented efficiency.

"The United States is at a crossroads with respect to critical minerals, and Xerion is committed to the development of technologies capable of paving the way for a dramatic reshaping of existing global supply chains," says CEO & co-founder Dr John Busbee. "Our nation's leadership in the defense and semiconductor sectors is directly impeded by a reliance on gallium alloy supply chains dominated by foreign markets like China, and we are passionate about remedying that vulnerability to support domestic industrial development," he adds. "We look forward to working with the DLA and others as we bring this technology to market."

Xerion says that, with this new technology, it is poised to reshape the domestic gallium alloys market, propelled by increasing use in semiconductors, optoelectronics and power electronics. Currently, over 98% of global gallium refinement is concentrated in China, and in December 2024 China implemented a ban on exports of gallium and germanium to the USA, creating a single-point-of-failure risk for the USA and its allies. The United States Geological Survey (USGS) issued an updated probability-based estimate of gallium metal interruption in August, which found that a disruption in gallium supply could trigger cascading effects, resulting in $1.4bn in direct economic losses and major setbacks in defense manufacturing. These challenges are compounded by a total lack of domestic production or emergency reserves in the USA, undermining the production and maintenance of critical defense platforms as well as the competitiveness of semiconductor manufacturers.

With its DirectPlate electrolysis technology... Xerion is developing the capability to refine gallium from several existing and readily available domestic sources containing varying low-level gallium content. The technology may also provide the capability to refine high-purity germanium, depending on the resource

Xerion claims that its technique for refining gallium metal is immediately cost-competitive with legacy refinement methods, in addition to offering a range of advantages related to environmental impact. This process involves inherently safe low-pressure processing, and drastically reduced electricity requirements compared with conventional refinement methods while minimizing permitting risk for commercial infrastructure development. Xerion's DirectPlate technique also features a closed-loop water recycling system, delivering significant water use advantages, in addition to requiring no organic solvents, resulting in a low-air-emission and low-flammability profile.

A key element of Xerion's commercialization pathway for refinement of gallium is participation in the DLA SBIR program, through which the company plans to establish a techno-economic analysis that validates the economic viability of the technology. Xerion expects to conclude Phase I activities by first-quarter 2026, and plans to pursue Phase II and Phase III funding and activities.

The announcement follows Xerion's recent launch of a pilot production line at its Dayton, Ohio manufacturing facility for the refinement of cobalt metal. Xerion reckons that, together, these announcements position it at the forefront of a critical industry transformation.

www.xerionbattery.com

USA and Australian governments supporting Alcoa's gallium development project in Western Australia

US, Australia and Alcoa special purpose vehicle to form joint venture with JAGA to construct plant

Alcoa Corp (which provides bauxite, alumina and aluminium products) has welcomed the announcement of the USA and Australian governments to advance the development of a gallium plant to be co-located at its Wagerup alumina refinery in Western Australia.

This follows support for the project from Japan Australia Gallium Associates Pty Ltd (JAGA) — a Perth-based joint venture formed in March between Sojitz Corp and the Japan Organization for Metals and Energy Security (JOGMEC) — through a joint development agreement (JDA) with Alcoa announced in August. Following completion of feasibility assessments, Alcoa expects that a joint US, Australia and Alcoa special purpose vehicle (SPV) would enter into the joint venture with JAGA to construct a gallium plant. Operated by Alcoa, the plant is expected to produce 100 metric tons of gallium annually.

Under the terms of the non-binding agreement, the US and Australian governments and Alcoa would provide capital to the SPV and receive gallium offtake in proportion to their interests. Among other purposes, the capital would be used for the preparation of final feasibility studies, and the development and construction of the project. Definitive agreements for the gallium joint venture will be prepared between the governments of the USA, Australia and Japan, and Alcoa and Sojitz.

Gallium is recognized by the USA, Australia and Japan as being vital to national security. Globally, gallium production is concentrated from a single source, and market controls have heightened interest in establishing and securing alternate supply chains.

"Alcoa has been a strong contributor to both the American and Australian economies and welcomes the opportunity to support both nations in progressing a new source of gallium," says the company's president & CEO William F. Oplinger.

"The investment support from the US and Australian governments underscores Alcoa's role in supporting the development of the critical mineral supply chain, and the importance of our Australian operations not only to the aluminium industry but also as key to manufacturing, technology and defense industries."

Alcoa says that it will continue to work cooperatively with the Western Australian Government to progress the project under the State Agreement and approvals framework. The parties are targeting 2026 for final investment decision and production.

www.alcoa.com
www.sojitz.com/en
www.jogmec.go.jp/english

Australia's Nimy signs MoU for sale of gallium to USA's M2i Global

Critical minerals provider to provide project funding options and introductions to third-party corporations and government agencies

Mining exploration company Nimy Resources Ltd of Perth, Western Australia has signed a non-binding memorandum of understanding with Nevada-based M2i Global Inc (Minerals Metals Initiatives) for the sale of gallium from Nimy's Block 3 discovery in Western Australia.

M2i will seek to provide funding options for Block 3 and introduce Nimy to relevant third-party corporations and government agencies that may assist with the project. M2i may also seek to facilitate sales to US Government purchasers, including the Department of Defense.

Nimy and M2i will now collaborate with the aim of forming commercially binding contract terms for respective sale and purchase of a portion of gallium production.

"This MOU with M2i Global represents a pivotal moment for Nimy as we advance the Mons Project towards production," says managing director Luke Hampson. "This partnership not only validates the quality of our pending gallium resource definition but also positions Nimy to play a critical role in supplying the US market with this strategically important mineral," he adds.

"M2i Global is excited to partner with Nimy Resources to secure a reliable, high-quality source of gallium for the United States," says M2i Global's CEO Al Rosende. "This MOU underscores our commitment to building a robust critical minerals supply chain, and we are eager to support the development of the Mons Project through financing and strategic collaborations, including potential US Government involvement."

www.m2i.global
www.nimy.com.au

US DOE's TRACE-Ga to fund gallium recovery from US metal processing feedstocks

'Technology for Recovery and Advanced Critical-material Extraction–Gallium' initiative to be managed by ENERGYWERX

The US Department of Energy's (DOE) Office of Fossil Energy and Carbon Management (FECM) has announced up to $6m in federal funding available for R&D projects to help establish a secure domestic supply chain for gallium.

The Technology for Recovery and Advanced Critical-material Extraction –Gallium (TRACE-Ga) initiative aims to drive innovative and cost-effective technologies for gallium recovery from US metal processing feedstocks, advancing the USA's commitment to strengthen its critical minerals supply chain. Developing domestic supply chains for gallium should help to strengthen the USA's national security by fostering the commercialization of cutting-edge technologies, expanding the nation's critical materials portfolio, and reducing the reliance on foreign sources.

The TRACE-Ga initiative is managed by ENERGYWERX through a Partnership Intermediary Agreement set up by the DOE's Office of Technology Commercialization. The agreement enables ENERGYWERX to broaden DOE's engagement with innovative organizations and non-traditional partners, facilitating the rapid development, scaling and deployment of energy solutions.

Projects will test and validate prototype technologies with a goal of producing at least 50kg of pure gallium from at least one 14-day campaign of continuous operation with a real-world metal industry processing stream, such as aluminium or zinc. The objective is to validate a prototype that is capable of producing at least 1 metric ton per annum scale of gallium. Successful projects will restart domestic primary gallium recovery for the first time in almost 40 years.

Applicants to the TRACE-Ga funding opportunity must qualify as a domestic entity. With a submission deadline of 20 November, eligible applicants will be asked to provide:

- evidence of success for recovering gallium from feedstock similar to the proposed metal industry process stream;
- a letter of support from any company, agency or other party that has ownership/rights to any proposed feedstock materials, where applicable; and
- a description of the potential for scale-up at the initial metal industry processing stream and market adoption beyond the initial metal industry processing stream source.

DOE expects to make between one and three awards with a minimum of 20% cost-sharing from the awardees. Awardees are expected to be notified in early 2026.

www.energywerx.org/opportunities/technology-for-recovery-and-advanced-critical-material-extraction-gallium

5N Plus' CFO Richard Perron to become president & CEO

CEO Gervais Jacques to be appointed executive chairman in May, as Luc Bertrand becomes lead independent director

Specialty semiconductor and performance materials producer 5N Plus Inc (5N+) of Montréal, Québec, Canada says that its board of directors has appointed Richard Perron as president (effective 1 November) in addition to his current role as chief financial officer. This is part of the firm's CEO succession plan, with Perron expected to assume the role of president & chief executive officer (effective 31 May 2026).

Gervais Jacques will continue as CEO through 31 May, when he will be appointed as executive chairman of the board. Existing chairman Luc Bertrand will become lead independent director. This transition plan reflects the board's commitment to a seamless CEO succession process to ensure leadership continuity and continued execution on 5N+'s strategic priorities.

"Richard's business acumen, strategic insight and deep understanding of our sector make him the ideal choice to lead 5N+ into the future," comments Bertrand. "Since joining the company in 2014, Richard has played a pivotal role in driving 5N+'s financial strategy, advancing its growth objectives and strengthening overall performance," he adds.

"On behalf of the board, I also want to extend our deep gratitude to Gervais for his exceptional leadership and vision as CEO since 2021," says Bertrand. "Gervais has been instrumental in shaping the company's strategy and guiding 5N+ on a path of focused and accelerated growth, positioning it well for the future. We are pleased that he will continue to contribute to 5N+'s success once he completes his mandate as CEO, by providing invaluable guidance and leadership as executive chairman."

The firm has initiated a search process to identify a successor for the chief financial officer role.

www.5nplus.com

Aixtron's preliminary Q3/2025 EBIT halved as revenue falls 23% year-on-year

Full-year 2025 revenue guidance narrowed from €530–600m to €530–565m

In light of the soft market environment and negative FX effects, deposition equipment maker Aixtron SE of Herzogenrath, near Aachen, Germany is adjusting its forecast for 2025.

Revenue in third-quarter 2025 is about €120m, down 23% on Q3/2024's €156.3m, but within the guidance range of €110–140m.

Due to the negative impacts of volume shifts from Q3/2025 into Q4/2025 (€8m) and foreign exchange (FX) effects (€2m), gross margin has fallen from 43% in Q3/2024 to about 39% in Q3/2025.

The operating result (EBIT) has more than halved from Q3/2024's €37.5m (EBIT margin of 24%) to about €15m in Q3/2025 (EBIT margin of about 13%).

Preliminary order intake in Q3/2025 is €124m, down 13.5% on Q3/2024's €143.4m.

"The demand upturn has not yet materialized in Q3/2025, such that we are now narrowing the revenue guidance for the full year to the lower half of the initial range," notes CEO Dr Felix Grawert. "Q3/2025 is negatively impacted by volume shifts and FX effects, which have only limited impact on our full-year results," he adds.

Based on current market developments and an adjusted exchange rate of US$1.15/€ for the rest of 2025 (rather than US$1.10/€ previously), Aixtron's executive board has hence narrowed its full-year 2025 guidance for revenue to €530–565m, which corresponds to the lower half of its initial guidance of €530–600m.

FX effects have led to an approximately 1 percentage point reduction in guidance for both gross margin (from 41–42% previously to 40–41%) and EBIT margin (from 18–22% previously to 17–19%).

"We are on track with respect to our operational metrics for the full-year 2025, besides the loss of gross profit due to FX effects," says Grawert. "Our medium- and long-term growth drivers, e.g. with the introduction of new 800V architectures for AI data centers using both SiC [silicon carbide] and GaN [gallium nitride], remain intact," he adds. "By expanding our market position, we will benefit disproportionately from the next upturn."

Aixtron ships its 100th G10-SiC system

Delivery made to European power device and system maker, ramping up 200mm silicon carbide epitaxy capacity

Aixtron has shipped its 100th G10-SiC system, underscoring the market demand for its G10-SiC epitaxy batch technology over the last three years since its launch.

The delivery was made to a European power device and system maker, supporting the ramp-up of 200mm SiC epitaxy production capacity.

Aixtron says that this highlights the strong global adoption of its SiC Planetary Reactor technology, which enables the production of highly uniform, high-quality silicon carbide (SiC) material.

"It demonstrates the strong market trust in our technology and confirms our leading position in enabling the global ramp-up of SiC power electronics — a key driver of the ongoing electrification of our society," says Dr Frank Wischmeyer, vice president Silicon Carbide at Aixtron.

Aixtron's G10-SiC system

The G10-SiC system features a unique multi-wafer 6x200mm batch configuration, combining the highest throughput with superior epitaxial film quality and yield, it is claimed.

It is equipped with Multi-Ject technology, delivering highly uniform epitaxial layers across a wide voltage class range of SiC devices.

The system also supports volume manufacturing on 150mm wafers, allowing flexibility during the industry's transition toward larger 200mm-diameter wafers.

www.aixtron.com

Stony Brook orders two CVD Equipment PVT150 systems for onsemi Silicon Carbide Crystal Growth Center

Systems to be installed at CVD Equipment for six months while center at SBU is established

CVD Equipment Corp (CVDE) of Central Islip, NY, USA (a designer and maker of chemical vapor deposition, thermal processing, physical vapor transport, gas and chemical delivery control systems, and other equipment and process solutions for developing and manufacturing materials and coatings) has received an order for two PVT150 physical vapor transport systems from Stony Brook University (SBU) for their new 'onsemi Silicon Carbide Crystal Growth Center'.

The recently launched research center will enable university faculty, scientists and students to conduct research on silicon carbide crystal growth and other wide-bandgap (WBG) materials and device-enabling technologies critical to improving energy efficiency in power semiconductors and foster the next generation of skilled professionals in this field.

"We are very pleased to support the onsemi Silicon Carbide Crystal Growth Center and provide SBU with state-of-the-art process equipment to advance critical semiconductor materials which are now driving the adoption of artificial intelligence and electrification," says CVD Equipment's president & CEO Manny Lakios.

The two PVT systems will initially be installed at CVD Equipment's headquarters in Central Islip for six months to assist SBU in the launch of the center while the facility on the Stony Brook campus is being established. "SBU students will have the opportunity to access the PVT systems and grow silicon carbide boules to support the center's research objectives and also to prepare them for career opportunities in high-demand technology fields," says Lakios.

In addition, CVDE is continuing to develop a 200mm silicon carbide crystal growth process using its PVT200 systems to meet the demands of the high-power electronics industry. The firm's PVT reactor design and control system architecture allows for precise process and temperature control, enabling run-to-run repeatability and system-to-system matching. CVDE's PVT system platform is also being considered to process other WBG materials such as aluminium nitride (AlN) to support the development of emerging, high-performance semiconductor materials.

www.stonybrook.edu
www.cvdequipment.com

JX making further investment in InP substrate production

Total investment of ¥3.3bn to boost capacity by about 50%

Due to rapidly increasing demand, particularly in the optical communications field, Tokyo-based JX Advanced Metals Corp is to make a further capital investment to boost production of indium phosphide (InP) substrates at its Isohara Plant in Kitaibaraki City, Ibaraki Prefecture.

Including the ¥1.5bn investment announced on 23 July to expand capacity by about 20%, the total capital investment is now about ¥3.3bn to increase InP substrate production capacity by about 50% compared to 2025 levels.

In recent years, against the background of rapid advances in generative AI, the construction of hyperscale data centers has accelerated globally, with further market expansion expected. As a result, data transmission volumes within data centers are surging, leading to a proportional increase in power consumption. In response, the shift toward optical communication is accelerating. This technology not only enables faster and higher-capacity data transmission than conventional electrical signals but also contributes to reducing power consumption.

InP substrates are essential for manufacturing high-performance devices used across a wide range of fields, including optical transmitters and receivers for optical communication, proximity sensors in wearable devices, and industrial image sensors. In particular, demand for optical transceivers using light-emitting and light-receiving elements is rapidly increasing. Furthermore, InP substrates are also expected to be adopted in photonic-electronic convergence technology, which is being developed as a next-generation information and communications infrastructure technology. Their use is anticipated not only for inter-data center but also for inter-board and even inter-semiconductor package communication applications.

In response to this growing demand, JX decided in July to make the capital investment. Moreover, anticipating the continued evolution of generative AI, the firm determined that establishing a system to handle the rapid surge in demand for InP substrates is an urgent priority and has decided on additional capital investment. JX expects future demand for InP substrates to continue increasing and is also continuing to consider further investments.

www.jx-nmm.com/english

Axcelis and Veeco to merge, forming fourth largest US wafer fabrication equipment supplier

Balance sheet to support investment in organic growth initiatives and share repurchase program

Ion implantation system maker Axcelis Technologies Inc of Beverly, MA, USA and epitaxial deposition and process equipment maker Veeco Instruments Inc of Plainview, NY, USA have entered into a definitive agreement to combine in an all-stock merger, forming a semiconductor equipment supplier worth about $4.4bn (based on Axcelis' and Veeco's closing share prices as of end-September, and outstanding debt as of end-June) offering an expanded product portfolio for complementary, diversified and growing end markets. On a pro-forma basis for fiscal year 2024, the combined company generated revenue of $1.7bn, non-GAAP gross margin of 44% and adjusted EBITDA of $387m (not including expected cost and revenue synergies).

Veeco shareholders will receive 0.3575 Axcelis shares for each Veeco share. At closing, Axcelis shareholders are expected to own about 58%, and Veeco shareholders about 42%, of the combined firm, on a fully diluted basis. The merger agreement has been approved unanimously by the boards of directors of both companies.

"This combination marks a transformational milestone for both Axcelis and Veeco, establishing a new leader in semiconductor capital equipment with complementary technologies, a diversified portfolio and an expanded addressable market opportunity," says Axcelis' president & CEO Dr Russell Low, who previously worked at Veeco. "Together, we will be well-positioned to serve large and growing end-markets poised to benefit from significant secular tailwinds," he believes.

"With increased R&D scale, the combination of these two exceptional businesses will accelerate our ability to solve material challenges, enable advanced chip manufacturing and build an even stronger company," says Veeco's CEO Dr Bill MiIler.

Strategic rationale and financial benefits are cited as:

- Increased addressable market opportunity. By integrating complementary technologies, solutions and offerings, the combined company will expand its total addressable market to over $5bn, with greater exposure to secular tailwinds including artificial intelligence and the corresponding demand for power solutions.
- Diversified technology portfolio and market segments to advance customer roadmaps. The combination will create the fourth largest US wafer fabrication equipment supplier by revenue, with the scale and resources to better compete throughout the global semiconductor equipment value chain. The combined company will offer a comprehensive product portfolio spanning ion implantation, laser annealing, ion beam deposition, advanced packaging solutions and metal-organic chemical vapor deposition (MOCVD). The expanded portfolio will be supported by aftermarket services for the combined company's global customers. These complementary capabilities are expected to provide revenue synergies through the integration of technology expertise, cross-selling and platform optimization.
- Combined complementary expertise and scale to deliver innovative solutions. The complementary teams and technical capabilities directly lead to stronger capacity, expanded R&D scale, accelerated innovation and new opportunities across key geographies and end-market segments. Customers should benefit from a more robust partner capable of supporting differentiated, next-generation technologies, accelerating their roadmaps.
- Resilient operating profile and strong balance sheet to drive growth and returns. On a pro-forma basis in 2024, the combined firm generated a 44% non-GAAP gross margin and 22% adjusted EBITDA margin (excluding anticipated cost synergies). Pro-forma cash is expected to be over $900m upon closing. The combined balance sheet should support organic growth of the businesses and provide a foundation to deliver capital returns to shareholders. Following the closing of the transaction, the combined company will execute a share repurchase program. Axcelis and Veeco expect annual run-rate cost synergies of $35m within 24 months following closing, with the majority achieved within the first 12 months, and accretion to non-GAAP earnings per share within the first 12 months post-closing. Run-rate synergies exclude additional savings associated with share-based compensation expense. Veeco's $230m in outstanding 2029 convertible bonds will be assumed by the combined company in connection with the transaction.

Governance, leadership and headquarters

Upon close, the combined company's board will consist of 11 directors: six from Axcelis (including Low) and four from Veeco (including Miller, who will also chair the board's Technology Committee). Thomas St. Dennis (currently on the boards of both firms) will serve as chairperson of the board. Axcelis' current chairperson Jorge Titinger will remain on the board of the combined company.

Low will serve as president & CEO. Axcelis' current chief financial officer James Coogan will serve in the same

role at the combined company.

Following the closing of the transaction, the combined company will be headquartered in Beverly, Massachusetts. To reflect the transformational nature of the merger, the combined company will assume a new name, ticker symbol and brand following close.

Timing and approvals

The transaction is expected to close in second-half 2026, subject to approval by shareholders of both companies, the receipt of required regulatory approvals and the satisfaction of other customary closing conditions.

www.AxcelisVeeco.com

Veeco launches Lumina+ MOCVD system

Rocket Lab places multi-tool order to double production of space-grade solar cells

Veeco has announced the launch and first commercial multi-tool order for its new Lumina+ metal-organic chemical vapor deposition (MOCVD) system. Launch services and space systems firm Rocket Lab Corp of Long Beach, CA, USA (the parent company of space power provider SolAero Technologies Corp) has purchased the tools as part of its ongoing project under the Department of Commerce's CHIPS and Science Act to expand domestic production of compound semiconductor products at its facility in Albuquerque, New Mexico.

The new production platform enables "cost-effective scaling for next-generation applications," says Anil Vijayendran, VP of the MOCVD product line at Veeco. The new platform combines "proven TurboDisc technology with breakthrough efficiency to set a new benchmark in compound semiconductor manufacturing," he adds.

Rocket Lab set the benchmark for high-volume production of space-grade solar cells and solar panels more than 25 years ago, powering some of the largest satellites in orbit. With this investment, Rocket Lab will double production capacity for space-grade solar cells while also serving as a source for domestically produced compound semiconductor and electro-optical device technologies. The Lumina+ tool platform is claimed to have the largest arsenic phosphide (As/P) batch size in the MOCVD industry, best-in-class throughput, lowest cost per wafer, and industry-leading uniformity and repeatability for As/P processes.

Veeco's collaboration with Rocket Lab also underscores the companies' strong relationship. Rocket Lab has used Veeco platforms for over 20 years, and the new Lumina+ system is expected to set a foundation for collaboration for years to come.

"This collaboration will enable us to meet the increasing demand for satellite solar power and serve as a trusted source of domestically produced semiconductor technologies," says Brad Clevenger, VP of Space Systems at Rocket Lab.

Combining scale with precision, the new Lumina+ system is said to offer improved process efficiency at the lowest cost of ownership. It aligns with the compound semiconductor industry's roadmap for high-performance, cost-effective optoelectronic devices, across diverse industries including not only solar but also consumer electronics, automotive, optical communications, and biotechnology.

www.rocketlabusa.com/space-systems/solar

www.veeco.com

Specialist foundry orders Veeco wet processing & litho systems for advanced packaging and silicon photonics

Veeco has received multiple orders for its advanced wet processing and lithography systems from a leading specialist foundry. The systems will be deployed for advanced packaging and silicon photonics applications, supporting critical end markets including AI, automotive, aerospace & defense, and communications. Scheduled deliveries for the most recent orders will start in first-quarter 2026.

"These orders underscore Veeco's position as a trusted partner for enabling next-generation device manufacturing in high-growth markets such as artificial intelligence, high-performance computing and silicon photonics," says Adrian Devasahayam, senior VP, product line management. "We remain committed to investing in new technologies and expanding our market reach through strategic partnerships and customer-driven innovation," he adds.

Veeco says that its WaferStorm, WaferEtch and AP300 platforms were selected for their best-in-class process performance, unique capabilities, and low cost of ownership. The WaferStorm solvent cleaning systems are claimed to set the industry standard for yield improvement, while WaferEtch systems enable precise interconnect and device definition, for improved performance. The firm's lithography systems support next-generation advanced packaging processes, including copper (Cu) pillars for 2.5/3D packaging, flip-chip bumping, fan-out wafer-level packaging (FOWLP) and high-density fan-out packaging.

www.veeco.com

Space Forge and United Semiconductors partner to develop supply chain for space-grown materials

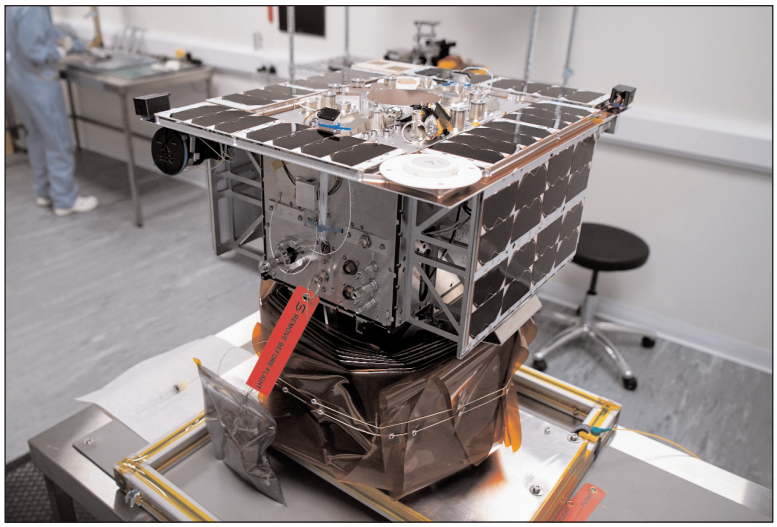
Microgravity materials deposition technology combined with crystal growth expertise and wafer processing

Advanced materials company Space Forge Inc (which operates from Florida's Space Coast) has signed a strategic memorandum of understanding (MoU) with United Semiconductors LLC (which specializes in bulk crystal growth and substrate production of III-V compound semiconductors from its facility in Los Alamitos, CA). The agreement formalizes the ongoing collaboration that started over a year ago.

The partnership establishes a collaborative foundation for developing commercially viable in-space semiconductor manufacturing capabilities, combining Space Forge Inc's microgravity-enabled materials deposition processes with United Semiconductors' expertise in ternary III-V semiconductor crystal growth and wafer processing.

Under the MoU framework, Space Forge Inc will design and develop advanced materials deposition processes and equipment, and integrate manufacturing systems compatible with its ForgeStar platform. United Semiconductors LLC will contribute its proven crystal growth processes, design specialized equipment and accessories for in-space manufacturing environments, identify potential materials suitable for space-based production and perform comprehensive wafer processing and testing. Leveraging their complementary capabilities, the partnership aims to bring joint projects to rapid fruition for end-customers' needs.

"This partnership marks an exciting evolution in our mission to establish a robust US semiconductor manufacturing footprint that onshores reliable and resilient supply chains here at home," says Space Forge Inc's president Michelle Flemming. "By combining our terrestrial and microgravity manufacturing capabilities with United Semiconductors' deep expertise in crystal growth and wafer processing, we're creating a powerful collaboration that can demonstrate the commercial viability of space-based semiconductor production. This partnership strengthens our commitment to advancing US leadership in advanced materials and in-space manufacturing," she adds.



"This partnership brings together key technical expertise that is essential for the rapid development of semiconductor materials manufacturing in space and its potential for commercialization for next-generation terrestrial and space microelectronics," says United Semiconductors' CEO president & CEO Dr Geeta Rajagopalan. "A robust commercial space economy in low-Earth orbit (LEO) will stimulate sustainable non-NASA utilization of future commercial LEO destinations (CLDs) and orbital platforms, assisting the US domestic industry to gain and/or maintain leadership in many critical technology sectors."

The collaboration reflects the growing momentum in commercial space manufacturing and addresses the increasing demand for ultra-high-quality semiconductor substrates for next-generation applications in quantum computing, telecommunications and advanced electronics.

By establishing clear development pathways and market applications, the Space Forge–United Semiconductors partnership aims to demonstrate the economic viability of space-based semiconductor production at commercial scale.

The companies plan to work together over the coming months to develop specific project frameworks with strategic long-term customers.

www.unitedsemiconductorsllc.com
www.spaceforge.com/usa

Riber's first-half 2025 revenue and earnings impacted by deliveries being concentrated into second-half

End-June order book of €27.7m supplemented by €14m in later orders

Molecular beam epitaxy (MBE) system maker Riber S.A. of Bezons, France has confirmed a 22% drop in revenue from €13.7m in first-half 2024 to €10.7m for first-half 2025, reflecting a delivery schedule that is concentrated into second-half 2025. The firm says that, in a complex international environment, it recorded solid commercial activity, despite particularly pronounced seasonality.

MBE Systems revenue fell by 17% from €9.4m to €7.8m, comprising the delivery of three machines (including two production systems) compared with three production systems in the same period last year.

Services & Accessories revenues fell by 31% from €4.3m to €3m.

Gross margin rises, despite net loss

Given the traditional seasonality of sales, first-half results cannot be extrapolated to the full year, notes Riber. This trend is reinforced in 2025, with only around one quarter of revenue generated in the first half, which nevertheless bears nearly half of fixed costs.

Despite the drop in revenue, gross margin has risen from 34.8% in first-half 2024 to 36.2% in first-half 2025. Including net financial expenses of €0.1m, net loss was €0.8m, compared with a profit of €0.2m in first-half 2024.

During first-half 2025, net cash fell from €8.6m to €2.5m, reflecting the impact of delivery seasonality on working capital requirements, the distribution to shareholders from the issue premium paid out in June, and sustained levels of investment. Shareholders' equity fell from €23.6m to €21.3m, primarily due to the half-year earnings and the distribution to shareholders from the issue premium.

Order trends in first-half 2025

Riber says that it continues to strengthen the appeal of its technological offering with the rollout of its silicon photonics roadmap and the signing of the first two sales of its (Riber Oxide on SIlicon Epitaxy) platform, a key step towards industrialization of this innovative equipment. This momentum is reflected in the sustained level of order intake, with a total of nine systems ordered over the first nine months of 2025, both for research and for industrial production, particularly in the fields of datacom and quantum technologies. However, Services & Accessories activities are affected by economic uncertainties weighing particularly on the research sector, notes Riber.

At end-June 2025, the order book was €27.7m, down 23% on €36m at end-June 2024. MBE System orders fell by 25% from €30.2m to €22.5m (comprising nine machines, including six for production), due to the denial of two export licenses (representing €4m in lost orders) and longer approval time-lines for licenses. Services & Accessories orders fell by 11% from €5.8m to €5.2m.

However, this does not include the orders announced in August and September (two MBE 6000 production systems, one ROSIE machine, and one Compact 21 research system), worth a total of about €14m.

Outlook

In a context marked by the rollout of major investment programs in artificial intelligence (AI) and quantum technologies, Riber expects new orders in fourth-quarter 2025.

The ramp-up of ROSIE is being confirmed with the sale of the first two units, validating the growing interest from laboratories and industrial players for solutions compatible with silicon production lines, says Riber.

Given the visibility of its order book deliverable in 2025 and the opportunities for its equipment and services, Riber confirms its target of revenues above €40m for full-year 2025.

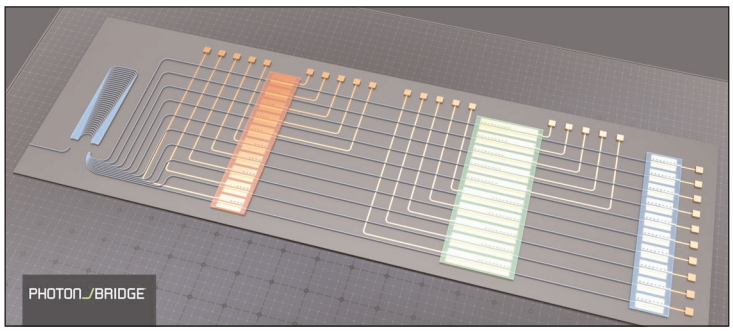
www.riber.com

Photon IP rebrands as Photon Bridge as it commercializes cantilever waveguide coupling technology

Photonic integration firm PHOTON IP of Eindhoven, The Netherlands has announced its new brand identity as Photon Bridge, and appointed Paul Marchal as its new chief executive officer.

The firm says that its new name is because its proprietary cantilever waveguide coupling technology is all about building bridges — between photonic materials (unifying III–V speed with the scalability of silicon) and between the integrated photonics used today and those powering tomorrow's breakthroughs. The rebrand reflects the mission to "connect innovation with scale, delivering solutions [optical engines] that advance the next generation of AI and telecom systems".

The announcement follows the firm's €4.75m seed funding round, backed by Innovation Industries, Faber, BOM, and PhotonDelta. The new brand reflects its mission to



bridge cutting-edge semiconductor technologies with the demands of a rapidly scaling optical market.

"Photon Bridge is about unifying the best of both worlds: the speed of III–V and the scale of silicon," says CEO Paul Marchal. "We are entering an era where AI and high-performance telecom demand a new level of optical integration, and our platform is uniquely positioned to deliver."

Before joining Photon Bridge, Marchal was co-founder & CEO of Morrow, where he raised over €35m and brought smart glasses based on tunable lens technology to market. Earlier, at imec, he co-developed through-silicon via (TSV) technology and co-introduced via-middle integration (now standard in advanced memory and GPU systems), while also contributing to the early development of imec's silicon photonics platform.

"I'm excited to continue as CTO and to focus fully on scaling our technology," says Photon Bridge co-founder Rui Santos. "With Paul leading the company and a strong team in place, we can accelerate innovation and bring our vision for integrated photonics to market."

www.photonbridge.ai

Photon Bridge's multi-material photonics platform demoed in PICadvanced's prototype transceivers

Collaboration underscores early traction for next-gen PON transceivers

Photon Bridge is collaborating with transceiver maker PICadvanced of Ílhavo Portugal to showcase prototype transceivers built using its multi-material integrated photonics platform.

Highlighted at the European Conference on Optical Communication (ECOC 2025) in Copenhagen, Denmark (28 September–2 October), the prototype is one of the first customer engagements using Photon Bridge's cantilever waveguide coupling technology, underscoring both technology maturity and early market traction.

Photon Bridge says its platform unifies the speed of III-V materials with the scale of silicon photonics, enabling compact, highly integrated optical engines. In collaboration with PICadvanced, Photon Bridge's photonic integrated circuit (PIC) — incorporating a tunable laser, modulators, and receive path — has been integrated into prototype pluggable transceivers targeting the passive optical networks (PONs).

"By combining III-V performance with silicon scalability, we're enabling smaller, more powerful and cost-effective transceivers that meet the growing bandwidth demands of telecom and AI systems," says Photon Bridge's chief technology officer & co-founder Rui Santos.

PICadvanced will leverage Photon Bridge's PIC to evaluate and develop a highly competitive pluggable module, benefitting from the small size and high levels of integration made possible by its platform.

"Photon Bridge's technology provides the integration density and performance required to advance the next generation of PON transceivers," comments António Teixeira, chief of strategy & technology officer at PICadvanced. "We're excited to be among the first to prototype this innovation, strengthening our ability to deliver cutting-edge solutions."

Photon Bridge reckons that the collaboration highlights its transition from development into customer-driven prototypes, establishing credibility with lead customer traction. Beyond PON, the technology provides a scalable foundation for optical engines powering future telecom and AI infrastructure.

www.ecoc2025.org
www.picadvanced.com
www.photonbridge.ai

Photon Bridge unveils integrated tunable laser PIC to power AI data-center interconnects

First customer OE Solutions secured as lead partner for ITLA modules

Photonic integration firm Photon Bridge of Eindhoven, The Netherlands has debuted its integrated tunable laser photonic integrated circuit (PIC), powered by its patented cantilever waveguide coupling technology (which combines III-V speed with silicon scale).

The device is the first commercial demonstration of Photon Bridge's integration platform and will be used by OE Solutions of Gwangju, South Korea (which makes indium phosphide-based lasers and optical transceivers for both wireless and wireline markets) as the laser engine inside its next-generation integrated tunable laser assembly (ITLA) modules.

Qualification is ongoing, with broader PIC sampling to additional customers anticipated in fourth-quarter 2025. Module sampling from OE Solutions is anticipated in second-quarter 2026.

Unlike conventional approaches, Photon Bridge says that its platform enables seamless combination of the optimal materials for each function — without restrictions on material choices — through a scalable, OSAT-compatible integration process. This flexibility allows the laser PIC to pair III-V gain and detection with low-loss silicon passive elements, all within a cost-efficient model ready for high-volume manufacturing.

The new tunable laser PIC integrates gain, semiconductor optical amplifier (SOA), filter, and wavemeter functions into a single device with a highly compact form factor. Samples already demonstrate linewidths below 100kHz and a full C-band tuning range, with product designs targeting a footprint of just 15mm2, delivering a fully integrated, highly cost-effective solution. Beyond ITLAs, the same integration platform is designed to scale toward compact, fully integrated coherent subsystems, enabling a new class of miniaturized optical engines for both telecom and AI infrastructure.

Built on a silicon foundation, the platform also provides a direct path to integrating coherent and coherent-lite long-range scale-across links into data-center switches in a footprint compatible with co-packaged optics (CPO). This opens the door to next-generation switch architectures where advanced optical engines are natively embedded, maximizing bandwidth density while minimizing power and cost.

Photon Bridge notes that this development comes at a pivotal moment for the industry. Explosive growth in AI data centers is fuelling a global race to scale-across massive GPU clusters, creating unprecedented demand for faster optical interconnects. The firm claims that its unique integration technology directly addresses this challenge, combining performance, scalability and efficiency in a way that no other platform can.

"AI data centers are racing to scale-across massive GPU clusters, creating exploding demand for compact, energy-efficient tunable lasers," says CEO Paul Marchal. "Our silicon-based integration platform is built for this moment — delivering the performance customers need today in ITLAs, while extending naturally to DWDM architectures, co-packaged optics (CPO) and fully integrated coherent links in next generation data-center switches," he adds. "Partnering with OE Solutions to bring this technology to market underscores both the strength of our platform and the credibility of our execution."

OE Solutions is already integrating the new PIC into its ITLA, positioning it at the forefront of next-generation coherent communication systems.

"The ability to combine the best materials without compromise — and to do so with a scalable, cost-efficient process — enables compact, high-performance ITLAs and next-generation coherent modules," comments OE Solutions' CEO Y.K. Park.

www.ecoc2025.org
www.oesolutions.com
www.photonbridge.ai

Mojo Vision adds Dr Waguih Ishak to advisory board

Photonics pioneer to provide guidance on technology and product roadmap for optical interconnects in AI data centers

Mojo Vision Inc of Cupertino, CA, USA — which is developing and commercializing micro-LED display technology for consumer, enterprise and government applications — has appointed Dr Waguih Ishak to its advisory board, bringing decades of leadership experience in photonics and optoelectronics to its efforts to apply its micro-LED technology to the development of high-speed optical interconnects for AI infrastructure.

This builds on Mojo's $75m Series B fundraising round in early September and positions the company to deploy its technology across high-growth markets, including AI data centers and next-generation AI glasses.

During a career spanning five decades at some of the world's most influential technology companies, Ishak has held senior leadership roles including VP & chief technologist at Corning for 16 years, VP & chief technology officer of Avago Technologies (Broadcom), and nearly three decades as VP & director of the Photonics Research Lab at Agilent/HP.

Ishak has also been an adjunct professor at Stanford University, where he founded the Stanford Photonics Research Center (SPRC) in 1999. His contributions have earned him the distinction of IEEE Life Fellow and election to the US National Academy of Engineering, the Canadian Academy of Engineering, the Royal Academy of Engineering (UK), and the Royal Society of Canada's Academy of Sciences. Ishak received the IEEE Photonics Society Industry Achievement Award in 2024 for "enduring, transformational and strategic global leadership in the development, promotion and introduction of photonic products including commercial VCSELs and the computer laser mouse."

"Mojo Vision's micro-LED platform represents one of the most exciting opportunities I have seen in my decades of photonics innovation," comments Ishak. "The ability to apply this technology to optical interconnects for AI infrastructure is especially compelling. It has the potential to redefine performance standards in optical interconnects, particularly as AI applications continue to push the boundaries of traditional data-center architectures."

Ishak joins fellow advisory board member Dr Rajeeva Lahri (a semiconductor industry veteran with a track record of introducing new technologies to the market) along with representatives from Mojo Vision's strategic customers, further strengthening the company's foundation of experience and expertise. "Advisory boards are critical for guiding companies through pivotal technology and market transitions," says Lahri. "Adding a visionary leader like Dr Ishak amplifies Mojo Vision's credibility and strengthens its ability to scale its platform into the markets that need it most," he adds.

"Dr Ishak's decision to join our advisory board is a resounding endorsement and validation of Mojo's vision and technology from one of the most respected pioneers in photonics," says CEO Dr Nikhil Balram. "His legendary track record and global reputation will be a powerful catalyst as we scale our technology into large AI markets and unlock its full potential," he adds.

"Waguih's insight and experience have the power to supercharge our work in optical interconnects, one of the critical enablers of next-generation AI infrastructure," reckons chief technology officer Dr Mike Wiemer. "His guidance will be invaluable as we push the boundaries of performance and innovation to redefine what's possible with our cutting-edge micro-LED platform," he adds.

"Few individuals have shaped the field of photonics as profoundly as he has, and his reputation and pioneering contributions will amplify Mojo's leadership while accelerating our mission to transform industries with our micro-LED platform," says board member Dr Achin Bhowmik, currently chief technology officer and executive VP of engineering at Starkey, and former VP & general manager of perceptual computing at Intel.

www.mojo.vision

CEA-Leti and CRHEA present step toward full-color AR/VR micro-displays at MicroLED Connect Conference

Record-setting red emission from InGaN quantum wells presented at MicroLED Connect Conference

Micro/nanotechnology R&D center CEA-Leti of Grenoble, France and CNRS–CRHEA (Centre de Recherche sur L'Hétéro-Epitaxie et ses Applications — Centre National de la Recherche Scientifique) in Sophia Antipolis, France, which specializes in epitaxial growth of wide-bandgap semiconductor materials, have announced R&D results that have cleared a path toward full-color micro-displays based on a single material system, a long-standing goal for augmented and virtual reality (AR/VR) technologies.

The paper 'Regular Red-Green-Blue InGaN Quantum Wells With In Content Up To 40% Grown on InGaN Nanopyramids' was presented at the MicroLED Connect Conference in Eindhoven, the Netherlands on 24 September.

The project developed a technique for growing high-quality indium gallium nitride (InGaN)-based quantum wells on sub-micron nanopyramids, enabling native emission of red, green and blue (RGB) light from a single material system.

Micro-displays for immersive devices require bright RGB sub-pixels smaller than 10μm x 10μm. "The use of III-nitride materials promises high-efficiency micro-LEDs compared to their organic counterparts," notes the paper. "However, for such a pixel size, the pick and place process is no longer suitable for combining blue and green micro-LEDs from III-nitrides and red micro-LEDs from phosphide materials on the same platform." Red-emitting phosphide micro-LEDs also suffer from efficiency losses at small sizes, while color conversion methods face challenges in deposition precision and stability.

The team grew InGaN nanopyramids using metal-organic vapor phase epitaxy (MOVPE) with an epitaxial graphene layer on silicon carbide serving as a selective mask.

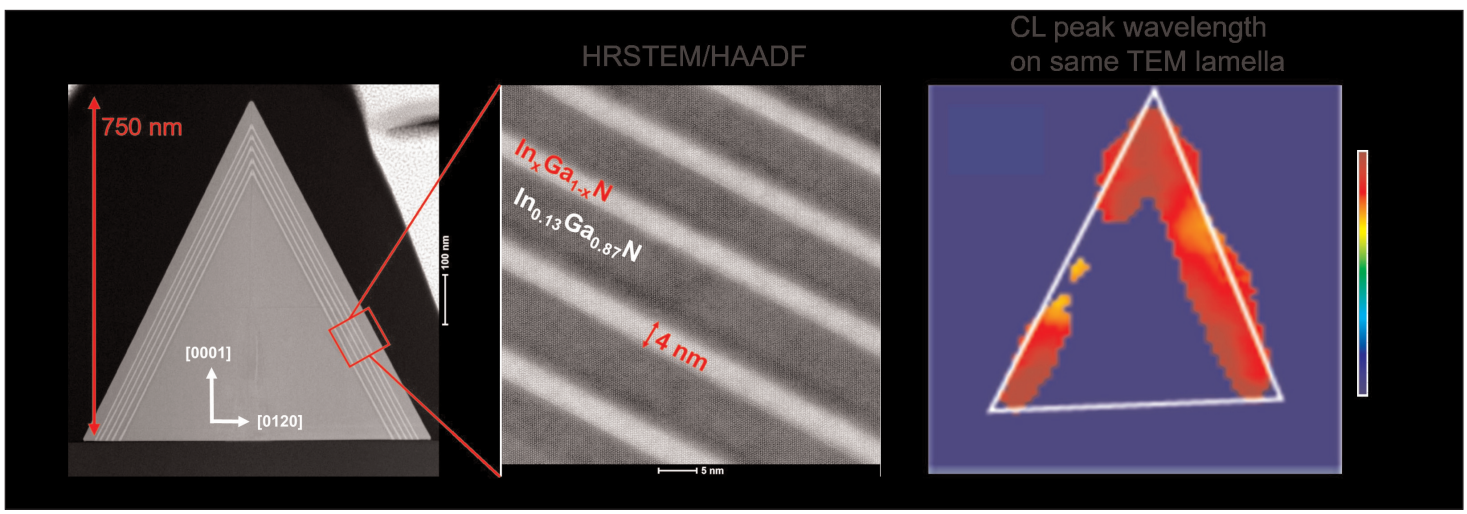
"Using these nanostructures relieved the internal strain that usually limits indium incorporation," says lead author Amélie Dussaigne of CEA-Leti. "As a result, we achieved record indium nitride mole fractions of 40% in the quantum wells — high enough to generate red light reliably without degrading crystal quality," she adds.

"This new technology addresses one of the most difficult bottlenecks in display miniaturization," says Adrien Michon, a research scientist in the project with CRHEA. "It opens the door to manufacturing full-color micro-displays with unmatched brightness and resolution — critical for next-generation AR and VR."

Implications for AR/VR displays

The researchers say that the breakthrough enables native RGB emission from a single material system, simplifying integration and improving performance in future micro-displays. Because the nanopyramid structures can be patterned at sub-micron scale, they are well suited for the <10μm pixel pitch demanded by AR/VR headsets, smart glasses and other immersive devices. Longer-term applications include full-color micro-displays for AR/VR, fast optical communications (emission + reception) and, beyond that: photovoltaic applications, and renewable hydrogen production.

www.microledconnect.com/agenda2025
www.nature.com/articles/s43246-024-00725-8
www.leti.fr
www.crhea.cnrs.fr/en/presentation.htm



Very regular InGaN-based quantum wells on the nanopyramid sidewalls. High indium content (42% and up to 45%), homogeneous red emission. (Images courtesy of CEA-Leti).

Cree LED and ADJ settle with limited license agreement

Patent infringement dispute related to LED components in displays

Cree LED Inc of Durham, NC, USA (a Penguin Solutions brand) and ADJ Products LLC have reached a mutually beneficial settlement resolving a patent infringement dispute involving Cree LED's patents related to LED components commonly used in LED displays. As part of their settlement, Cree LED has granted ADJ a limited license to certain patents covering LED components.

Cree LED says that it is firmly committed to protecting its intellectual property as part of its broader mission to drive innovation in LED display technology. As a US-based firm with significant investments in research, development and product quality, Cree LED actively monitors the global market to identify and address unauthorized use of its patented technologies. This spans the entire value chain, from manufacturers and suppliers to specifiers and end users, ensuring that Cree LED's innovations remain protected and that customers can rely on the integrity and performance of its solutions, adds the firm.

www.cree-led.com
www.adj.com

AquiSense achieves US-EPA disinfection validation and NSF 61 certification

AquiSense Inc of Erlanger, KY, USA (which designs and makes UV-C LED water disinfection systems) says that its Pearl Aqua Kilo full-scale UV-C LED product has been awarded NSF/ANSI/CAN 61-2024 certification and completed the validation process required by the US Environmental Protection Agency (EPA) UV Disinfection Guidance Manual (UVDGM), providing water utilities and industrial users with a new, highly effective tool for protecting public health.

"Achieving both UVDGM validation and NSF 61 certification is a major milestone not only for our company, but for the water treatment industry globally," says CEO Oliver Lawal. "With these third-party validations, water operators can install the PearlAqua Kilo System with complete confidence, knowing they are deploying a solution that has been independently and stringently verified for both performance and material safety."

The EPA UVDGM validation is the gold standard for validating UV reactor performance for large municipal drinking water applications. It proves that the PearlAqua Kilo reliably inactivates harmful, chlorine-resistant microorganisms like Cryptosporidium and Giardia under a wide range of water quality and operational conditions. The rigorous testing was conducted by an independent third party and confirmed the system's ability to consistently deliver the required UV dose.

The NSF mark, issued by the National Sanitation Foundation and verified by IAPMO Research and Testing, certifies the safety and performance of products in contact with drinking water, ensuring that these products are manufactured with materials that are safe. Products that are certified as meeting NSF/ANSI/CAN 61-2024 standards have been rigorously tested and meet the criteria for use in public water supply systems. This standard is recognized and enforced by regulatory agencies across North America and globally. It is a requirement for many municipal and industrial projects.

"Validation is an important component to innovation, and we are proud to provide certified LED solutions to serve municipal and industrial markets, ensuring broader market access and competitive advantages for mercury-free drinking water applications," says AquiSense's chief technology officer Jennifer Pagan.

Key features and benefits of the Pearl Aqua Kilo system are said to include:

- proven performance: UVDGM validation provides assurance of effective disinfection against harmful pathogens for large-scale water treatment plants;
- enhanced public safety: NSF 61 certification guarantees that the system's materials are safe for use in drinking water applications, ensuring consumer protection;
- operational excellence: the system is designed for ease of use and maintenance, with advanced monitoring features that ensure compliance and consistent performance;
- sustainable solution: the Kilo offers a chemical- and mercury-free disinfection method, aligning with a growing demand for sustainable water treatment practices.

NSF/ANSI/CAN-61 is a North American standard that establishes health-based criteria for materials and products in contact with drinking water, ensuring that they don't leach harmful contaminants. Products undergo rigorous third-party testing to confirm that they meet safety thresholds for metals, non-metals and other leachables, providing confidence in the safety and integrity of drinking water systems.

The US EPA has a mission to protect human health and the environment and works to have clean air, land and water. The Ultraviolet Disinfection Guidance Manual provides technical guidance for the application of ultraviolet light for the disinfection of drinking water by public water systems.

www.aquisense.com

FBH showcases latest R&D results

On 8–9 October, the Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (FBH) of Berlin, Germany presented its latest research findings at the Photonics Days conference in Berlin-Adlershof. FBH also showcased its educational activities, which are implemented as part of the national 'Microtec Academy' initiative to secure skilled professionals. In addition, FBH took part in the 'Working in Photonics' format.

Professor Tim Schröder, professor Markus Krutzik and Dr Sven Ramelow – each of whom heads a joint lab of FBH with Humboldt-Universität zu Berlin (HU Berlin) – chaired four quantum symposia (Q-Imaging, Q-Communication, Q-Computing, and Q-Sensing), supported by Dr Tommaso Pregnolato (FBH) and Dr Gregor Pieplow (HU Berlin). The symposia aimed to provide an overview of current trends and developments and to build bridges between cutting-edge research and industrial applications. Quantum technologies and laser modules for space applications were also featured during a guided laboratory tour at FBH, as part of the conference's supporting program.

UVC LEDs for medical applications and gas sensing

FBH this year placed special emphasis on ultraviolet light-emitting diodes (UV LEDs). Dr Sven Einfeldt, head of the Joint Lab GaN Optoelectronics at FBH, was one of the chairs of the session 'UV & X-Ray Technologies & Applications'. In this context, Dr Jan Ruschel presented recent technological advances in UVC LEDs. The institute has succeeded in significantly improving the efficiency, lifetime and performance of LEDs emitting in the far-UVC range below 235nm. These advances open up new applications in medicine and gas sensing. For example, harmful micro-organisms, including multidrug-resistant pathogens (MDR), can be killed without the risk of resistance development. Because light at these wavelengths is strongly absorbed, it penetrates only minimally into the living layers of skin, enabling effective disinfection without causing damage beyond that of normal sun exposure.

Miniaturized far-UVC diode laser module for disinfection

UVC radiation for medical use is also the focus of the 'UV-COLA' project, which Susann-Alice Seeger presented in her company pitch. This spectral range can be accessed using both LEDs and diode lasers. In the approach pursued jointly by FBH and University of Technology Chemnitz, violet-emitting semiconductor lasers provide the basis. In a MOPA configuration, brilliant, high-power radiation is generated and frequency-doubled into the UVC range using a nonlinear crystal. Coupled into a thin fiber, this radiation could be applied directly to disinfect the nose and throat area – a major reservoir for multidrug-resistant germs, from which they can spread or cause severe infections.

Gallium arsenide-based photonic integration

Many applications in quantum physics, spectroscopy or biosensing rely on lasers that emit at wavelengths of 630–1180nm. This spectral range can be addressed using gallium arsenide (GaAs). In his talk in the session 'Advances in hybrid PICs based on PolyBoard and SiN for communications, sensing and quantum technologies Part II', Dr Jan-Philipp Koester discussed the integration of GaAs chiplets onto low-loss, passive silicon nitride photonic integrated circuits (PICs) using micro-transfer printing.

At its booth, FBH also presented a monolithic GaAs-based photonic integrated waveguide platform with on-chip amplification and both shallow- and deep-etched passive waveguides. This platform forms the basis for ring-resonator-coupled lasers and is suitable for the 950–1180nm wavelength range.

www.photonic-days-berlin.com
www.fbh-berlin.de

ams OSRAM and Nichia expand their IP collaboration

Patent cross-license agreement extended from nitride LED and laser components to LED packages and modules

ams OSRAM GmbH of Premstaetten/Graz, Austria and Munich, Germany and Nichia Corp of Tokushima, Japan have expanded their long-standing collaboration in the field of intellectual property (IP). ams OSRAM's CEO Aldo Kamper and Nichia's president Hiroyoshi Ogawa signed a comprehensive cross-license agreement covering thousands of patent-protected innovations in LED and laser technologies.

The agreement grants both companies mutual access to each other's patents for nitride LED and laser components and, for the first time, also covers LED packages and LED modules, such as matrix headlamps. The move aims to strengthen the IP protection that both companies offer to their customers.

ams OSRAM and Nichia say they have invested heavily in R&D over decades. With the new patent cross-license agreement, they offer customers enhanced IP safety when using products based on their patented technologies. Both companies have a long history of cross-license agreements, which started in 2002, followed by an update in 2010. The new agreement covers R&D results from the last 15 years.

Nichia's president Hiroyoshi Ogawa (left) and ams OSRAM's CEO Aldo Kamper (right) sign the patent cross-license agreement.

"In an industry driven by innovation, intellectual property is the foundation of trust and long-term value. Unfortunately, we continue to see LED and laser products entering the market that do not meet essential IP standards," says Kamper. "Together with Nichia, we encourage customers to scrutinize claims of IP compliance and to choose partners holding a unique IP position like ams OSRAM and Nichia," he adds.

"Nichia and ams OSRAM have renewed the most comprehensive and robust cross-licensing agreement in the sector," says Ogawa. "Customers who select products from Nichia or ams OSRAM benefit from extensive patent protection, ensuring confidence in their business activities. Standing together, we will continue to safeguard the market's integrity by encouraging respect for intellectual property throughout our industry."

www.nichia.com
www.ams-osram.com

ams OSRAM extends CFO Rainer Irle's contract to 2030

The supervisory board of ams OSRAM AG of Premstaetten, Austria, and Munich, Germany has approved a new contract with chief financial officer Rainer Irle, running until 15 October 2030. The existing three-year contract expires on 30 June 2026.

"Over the past two years, Rainer Irle has played a key role in securing and strengthening the financial basis of ams OSRAM. We would like to thank him for his tireless work in accelerating the improvement of the company's financial structure and increasing its efficiency," says the supervisory board's chairwoman Dr Margarete Haase. "With this new contract, we recognize Rainer Irle's achievements and look forward to continuing our exceptionally good working relationship with him," she adds.

ams OSRAM's chief financial officer Rainer Irle.

"In recent years, we have successfully completed a complex refinancing process and implemented the 'Re-establish the Base' efficiency program," notes Irle. "I am delighted to be able to continue on this path to success."

After being appointed by the supervisory board in March 2023, Irle has been CFO since 1 July 2023. The 55-year-old has many years of experience in the semiconductor industry and, prior to joining ams OSRAM, was CFO of Siltronic AG from 2013. Previously, he held management positions in finance at Siltronic and Wacker Chemie AG.

Irle began his professional career at A.T. Kearney and Deutsche Bank. He holds a Master of Science in Engineering from Chalmers University of Technology in Gothenburg, Sweden, and a degree in industrial engineering from the University of Siegen.

www.ams-osram.com/about-us/executive-committee/rainer-irle

Honda Prize awarded to surface-emitting laser pioneer Dr Kenichi Iga

Honor for the conception and development of the VCSEL, and its practical application

The Honda Foundation has awarded the 2025 Honda Prize to Dr Kenichi Iga (honorary professor at Institute of Science Tokyo and 18th president of former Tokyo Institute of Technology) for his conception of the vertical-cavity surface-emitting laser (VCSEL) and pioneering contributions to its basic research and practical application.

Technological innovation through surface-emitting lasers

Compared with conventional semiconductor lasers which emit light horizontally relative to the substrate, VCSELs emits light vertically, making them more compact, and producing less interference among neighboring modes, which enables high-density integration.

Also, compared with conventional edge-emitting lasers, surface-emitting lasers exhibit stable oscillation at a single wavelength, ease of mass production, the ability to continuously vary wavelength, and low power consumption. Surface-emitting lasers are indispensable in

Dr Kenichi Iga.

short-range LiDAR, which precisely maps a vehicle's surroundings (ranging from tens of centimeters to several meters).

High-density placement enables simultaneous multi-point emission over a wide area, allowing instantaneous scanning. Furthermore, minimal wavelength variation is key to enabling high-precision measurement. Additionally, the compact and thin form factor facilitates easy integration into bumpers, mirrors and doors, and its low power consumption is also considered to be an excellent characteristic for automotive components.

Realizing practical applications

Iga proposed the concept of the surface-emitting laser in 1977. In 1988, Dr Fumio Koyama (currently distinguished professor/professor emeritus at the Institute of Integrated Research, Institute of Science Tokyo), a student of Iga's, succeeded in achieving continuous-wave operations at room temperature, paving the way for practical implementation.

Since then, researchers worldwide have engaged in surface-emitting laser research, with related papers now exceeding 60,000 globally. Worldwide adoption and development efforts by numerous companies have led to commercialization of the technology, enabling ultra-high-speed, high-capacity parallel communication in data centers and LANs, energy savings, 3D facial recognition in smartphones, and expansion into LiDAR.

The Honda Prize award ceremony is being held at the Imperial Hotel Tokyo on 17 November. In addition to the prize medal and diploma, the laureate is awarded a total of ¥10m.

www.hondafoundation.jp/

Photon Design showcases laser simulation tool updates

Three laser updates planned by end-2025

At the 2025 Optica Laser Congress and Exhibition in Prague, Czech Republic (19–23 October), photonic simulation CAD software developer Photon Design Ltd of Oxford, UK presented updates to three of its laser simulation tools: a quantum dot (QD) module for HAROLD; a PCSEL (photonic crystal surface-emitting laser) solution using HAROLD and OmniSim; and the PICWave photonic integrated circuit (PIC) design tool.

"Quantum dot lasers are at the forefront of next-generation LiDAR, datacoms, AI and HPC, due to the size, heat and power savings they offer in high-power laser applications," notes CEO Dr Dominic Gallagher. "Our HAROLD simulation tool now includes a quantum dot module, enabling engineers to model epitaxy structures, dot size, and distribution, with gain and absorption spectra results reliably matching real-world lasers," he adds.

"Our PCSEL solution integrates HAROLD and OmniSim to deliver high-power, coherent laser sources. HAROLD simulates a range of epitaxy structures, while OmniSim uses FDTD modelling to simulate light propagation and gain. Lastly PICWave, which is a photonic integrated circuit (PIC) design and simulation tool, integrates laser diode and SOA [semiconductor optical amplifier] modelling within a flexible, design flow environment," Gallagher continues.

"Enhancements to our PICWave and HAROLD laser simulation tools have been partly enabled by the addition of an application engineering function to our development team," he adds. "This strategic change has enabled us to accelerate the launch of new features and improve the performance and productivity of our simulations, further strengthening Photon Design's position as a leader in laser design."

www.optica.org/events/congress/laser_congress

www.photond.com

Director of Blue Laser Fusion Energy Collaborative Research Institute selected as project manager for Japan's Fusion Energy Moonshot Program Goal 10

The director of the Blue Laser Fusion Energy Collaborative Research Institute — jointly established by Blue Laser Fusion Inc (BLF) of Santa Barbara, CA, USA and the University of Osaka (UOsaka) — has been selected as one of the project managers (PMs) for Japan's Moonshot Research and Development Program to develop a fusion reactor using BLF's laser technology.

Led by the BLF Energy Collaborative Research Institute's director professor Shinsuke Fujioka of the High Energy Density Science Division in the UOsaka Institute of Laser Engineering (ILE), the project is a multi-year initiative focused on advancing BLF's laser, target ignition and reactor design, with a goal of demonstration of a laser-based fusion energy generation system. The Institute will collaborate with other research partners, with the detailed project plan to be finalized in consultation with the program director and the Japan Science and Technology Agency (JST).

The JST implements the Moonshot Program, which is led by Japan's Cabinet Office. The program pursues challenging R&D concepts set by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in order to solve issues facing Japan's future society. Moonshot Program Goal 10 is related to fusion energy: "Realization of a dynamic society in harmony with the global environment and free from resource constraints, through diverse applications of fusion energy."

Selection of the director of the BLF Energy Collaborative Research Institute as a project manager for Moonshot Program Goal 10 results from a competitive process led by JST and their external experts, including open calls and a review of a large number of applications, followed by multiple rounds of document and interview screening, culminating in final selection of a small number of university and corporate teams.

"We are pleased to collaborate with the University of Osaka, Japan's leading laser fusion research and technology institution, as we work to accelerate the commercialization of laser-based fusion energy," says Blue Laser Fusion's founder & CEO Shuji Nakamura. "BLF will continue to contribute, together with the University of Osaka, to solving Japan's energy challenges," he adds.

Blue Laser Fusion says that its enabling technology innovations include a high-efficiency, cost-effective optical enhancement cavity (OEC) laser delivering megajoule-class pulse energy at a high repetition rate, coupled with a high-gain fuel target to achieve commercial fusion. Beyond the Moonshot Program selection, BLF has won US Department of Energy INFUSE projects in collaborations with Caltech and Colorado State University, and the company is a corporate partner in the US DOE IFE-Star RISE HUB for inertial fusion energy. Additionally, Blue Laser Fusion is on the industrial council for the US DOE FIRE Collaboratives led by General Atomics on fusion targets and by Idaho National Labs on fusion reactor design.

www.jst.go.jp/moonshot/en/program/goal10/index.html
www.ile.osaka-u.ac.jp

Blue Laser Fusion wins US DOE INFUSE project award

Blue Laser Fusion Inc has won a US Department of Energy (DOE) INFUSE project award to further develop its novel high-energy pulsed laser for inertial fusion energy applications in collaboration with Colorado State University (CSU).

The project focuses on developing advanced optical interference coatings for the Blue Laser Fusion optical enhancement cavity (OEC) laser to generate the high pulse energy and fast repetition rates required for high-gain, efficient fusion energy generation. The DOE funded work leverages the expertise of Dr Carmen Menoni, University Distinguished Professor of Electrical and Computer Engineering at Colorado State University. Menoni is said to be a world leader in amorphous oxide interference coatings, critical components of the most advanced laser systems. She is also director of the Inertial Fusion Energy RISE HUB, supported by the US Department of Energy.

The project was awarded as part of the DOE's Innovation Network for Fusion Energy (INFUSE) initiative, which awarded $6.1m to private-public collaborations in 2025 to accelerate the development of cost-effective, innovative fusion energy technologies in the private sector. The DOE INFUSE program's overarching aim is to ensure US energy, environmental & security needs.

"By cooperating with professor Menoni and her group at CSU, Blue Laser Fusion will have access to world-class optics expertise and capabilities to advance our OEC laser innovations," says CEO Shuji Nakamura.

"We will fabricate and evaluate interference coatings to create world-class mirrors to support the BLF optical enhancement cavity platform and develop characterization tools to evaluate the reflectivity and thermal performance of the mirrors," says Menoni. "The BLF OEC enables a new performance regime for high-energy pulsed lasers that can be used to drive fusion reactions."

https://infuse.ornl.gov
www.bluelaserfusion.com

NUBURU to acquire Orbit, expanding defense & security hub with operational resilience solutions

Acquisition positions Nuburu Defense in defense-grade SaaS platforms

NUBURU Inc of Centennial, CO, USA — which was founded in 2015 and developed and previously manufactured high-power industrial blue lasers — says that its subsidiary Nuburu Defense LLC has secured a binding agreement to directly acquire Orbit S.r.l., an Italian software company specializing in operational resilience, business continuity, and crisis management for mission-critical organizations.

The agreement involves a two-phase transaction and marks a step in the build-out of NUBURU's Defense & Security Hub, expanding its capabilities beyond advanced laser and vehicle systems into the rapidly growing domain of software-driven resilience and crisis readiness.

Strategic rationale

Orbit's platform enables organizations to anticipate, manage and recover from disruptions across physical and digital environments — capabilities increasingly prioritized also in the defense sector by NATO, the US Department of Defense, and other allied agencies. By integrating Orbit's Software-as-a-Service (SaaS) technology with Tekne's electronic warfare and NUBURU's laser systems, the company aims to deliver an end-to-end suite of defense and infrastructure resilience solutions.

"This binding agreement is a pivotal step in our evolution," says NUBURU's executive chairman & co-CEO Alessandro Zamboni. "Orbit's software perfectly complements our defense hardware portfolio, allowing us to offer comprehensive, interoperable systems that protect mission-critical assets and enhance operational readiness."

Market opportunity

The addressable market for operational resilience, business continuity and crisis management technologies across US, EU, and NATO defense organizations is estimated to be $2.9–3.6bn in 2025, expanding by more than 10% annually. NUBURU reckons that the agreement positions it to participate directly in this fast-growing sector and meet rising demand for integrated resilience solutions driven by defense digitalization and new threat environments.

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Financial outlook

Based on its business plan and independent analysis, Orbit projects strong revenue acceleration to $3.22m by 2026, then $10.75m by 2027, and $19.29m by 2028. These projections reflect Orbit's expanding client base and the scalability of its SaaS business model, which carries attractive gross margins and recurring revenue potential.

Acquisition terms

The transaction will be executed in two stages:

- initial capital increase: Nuburu Defense LLC will subscribe up to $5m in Orbit's capital within 36 months, starting with a $1.5m advance for a 10.7% stake;
- final acquisition: Nuburu Defense LLC will acquire the remaining equity of Orbit at a $12.5m pre-money valuation by end-December 2026.

As part of the agreement, Nuburu Defense receives exclusive global distribution rights for Orbit's platform in defense and mission-critical sectors, effective immediately.

The total consideration of $12.5m includes a $2.4m net cash advance to Orbit's owner, to be paid in tranches and which accounts for the partial offset of a $1.35m NUBURU receivable. The remaining balance will be settled through NUBURU equity securities by the end of 2026, subject to stockholder approval.

Related-party review

Orbit is wholly owned by Alessandro Zamboni, who also serves as NUBURU's executive chairman & co-CEO. In accordance with corporate governance requirements, the transaction has been reviewed by an external financial advisor, who also provided the pricing analysis of Orbit, and has been approved by NUBURU's independent non-executive directors.

Defense-grade SaaS integration

Orbit's platform unites business impact analysis, crisis communications, and IT system mapping into a continuous plan–sense–decide–act–learn cycle. Its key defense applications include:

- real-time situational awareness from OSINT and sensor data;
- impact analysis and continuity planning for critical missions;
- readiness management through automated testing and evidence capture;
- crisis command and response with integrated alerting and after-action review.

"Orbit's proven technology directly supports the operational readiness and resilience goals of allied defense organizations," says Dario Barisoni, co-CEO of NUBURU & CEO of Nuburu Defense. "Together, we're combining defense-grade hardware and software into a unified platform built for the future of mission assurance."

www.nuburu.net

www.orbitopenplatform.com

NUBURU announces strategic alliance with Maddox Defense for controlling-interest JV to advance next-gen drone technologies

NUBURU Inc of Centennial, CO, USA — which was founded in 2015 and developed and previously manufactured high-power industrial blue lasers — has entered into a strategic framework agreement with Nuburu Defense LLC and Maddox Defense Inc of San Diego, CA, USA to establish a joint venture.

Controlled by Nuburu Defense, the JV will focus on the compliant development, manufacturing and deployment of advanced drone systems for both military and commercial applications.

Strategic objectives

The JV will design, manufacture and deploy adaptable military drones for NATO and allied customers, leveraging the combined technical and operational expertise of Nuburu Defense and Maddox Defense. The parties estimate that the NATO UAV defense market opportunity at $7–10.3bn annually.

In addition to defense programs, the JV's 2026–2028 plan includes a comprehensive go-to-market strategy for commercial and civil-sector drone deployment, built on synergies with NUBURU's core blue-laser platform, the Orbit operational-resilience system (recently acquired under controlling interest), and Tekne's defense-mobility suite.

The JV anticipates reaching about $100m in annual revenue by the end of 2028 and $165m cumulatively across 2026–2028.

Manufacturing approach

Operations will utilize rapid-manufacturing pods capable of deployable field fabrication through polymer and metal 3D printing, modular avionics, and scalable commercial components.

These mobile production units enable on-demand UAV assembly and re-configuration near operational zones while remaining compliant with applicable export-control laws.

Joint venture framework

Under the strategic framework agreement, the parties intend to execute a definitive joint venture agreement (JVA) on or before 15 December, establishing the JV under Italian law as a European-based manufacturing and research hub.

The collaboration will integrate complementary technologies for NATO-authorized programs while maintaining full US export-control compliance. No transfer of US-controlled defense technology or classified data is contemplated; all US-origin technical information remains subject to ITAR and EAR regulations.

Key anticipated terms include:

- Nuburu Defense to contribute up to $10m in capital funding;
- Maddox Defense to contribute eligible assets, intellectual property and personnel, formally appraised per Italian law;
- equity ownership allocated by assessed contributions, with Nuburu Defense retaining a controlling interest;
- a joint board of directors comprising representatives from both parties;
- a period of mutual exclusivity during negotiation and execution of the JVA.

"This framework agreement marks another pivotal step forward as NUBURU expands its presence across the defense and commercial sectors," says Alessandro Zamboni, executive chairman and co-CEO of NUBURU. "Our blue-laser innovation, paired with Maddox Defense's battlefield-proven UAV design and the capabilities of our Orbit platform, positions this JV to deliver next-generation, compliant drone solutions. We also anticipate strong synergies with Tekne's mobility technologies and client base," he adds.

"Maddox Defense is thrilled to partner with NUBURU to deliver advanced drone capabilities to NATO and civilian markets," said "Our Special Forces and intelligence-veteran engineering team brings combat-tested innovation and design intelligence — including direct experience supporting allied operations — that, when combined with NUBURU's laser systems and Orbit's resilience tools, creates a formidable platform for global defense and security," says Maddox Defense's founder Jason Maddox.

"This venture enables Nuburu Defense to extend our mission-critical laser solutions into the rapidly expanding drone domain," says Dario Barisoni, CEO of Nuburu Defense LLC. "Together with Maddox Defense, we're aligning innovation, rapid deployment, and regulatory compliance to meet NATO-standardized operational requirements," he adds. "The launch of the JV has ideal timing, considering the acquisition secured with Orbit and the recent interest of the Italian Government in Tekne, which has a perfect fit with the strategic and industrial alliance we have been building up with the company."

Regulatory and compliance

All technologies and systems developed by the JV will be designed and manufactured in full accordance with applicable US, EU and NATO export-control laws, ensuring responsible deployment of defense technologies solely to authorized partners and allied nations, says NUBURU.

The NUBURU–Maddox Defense JV combines NUBURU's proprietary blue-laser technology, Maddox Defense's combat-tested UAV engineering, and the Orbit operational-resilience platform to deliver scalable, rapid-response drone systems for defense, security and commercial applications worldwide.

www.nuburu.net

NUBURU implements dual-CEO structure to drive transformation plan

Co-CEOs Zamboni and Barisoni also appointed chairman and Nuburu Defense subsidiary CEO, respectively

NUBURU has implemented a dual-CEO structure, complementing Alessandro Zamboni's role as executive chairman and supports the company's ongoing transformation plan. The plan aims to achieve revenue growth starting in Q4 2025 through strategic acquisitions and international alliances, while also managing increased organizational complexity.

The board of directors has appointed Alessandro Zamboni and Dario Barisoni as co-chief executive officers (co-CEOs). In the new roles:

- Zamboni will continue to leverage his expertise as executive chairman and co-CEO, overseeing corporate strategy and financing, treasury and financial reporting, public and investor relations, and market strategy. This appointment formalizes his strategic leadership role during this critical phase.
- Barisoni will report to Zamboni and will focus on the operations of the firm's business and subsidiaries, implementing acquisitions and post-merger integration operations, driving synergies across business units, and developing operational and investment strategies, particularly within the defense sector.

In addition, Zamboni has been appointed chairman and Barisoni has been appointed CEO of subsidiary Nuburu Defense LLC, signaling the company's commitment to growth in this key market.

"This dual-CEO structure marks a pivotal step in NUBURU's transformation, aligning with a model that, historically, has demonstrated the potential to create significant value for shareholders in complex, growth-oriented companies," says Zamboni. "It underscores our commitment to strategic growth and operational excellence. I am confident that this leadership model will enable us to capitalize on emerging opportunities and deliver long-term value for our stakeholders," he adds.

"Having served as a non-executive director for the past nine months, I've gained a deep understanding of NUBURU's potential," comments Barisoni. "I am eager to transition into the role of co-CEO and leverage my expertise in the laser and defense sectors to contribute to NUBURU's strategic growth and transformation," he adds. "I am particularly excited to grow NUBURU's presence in the defense market,"

Barisoni has over 30 years of leadership experience in the defense-tech and technology sectors, making him suitable to drive NUBURU's strategic initiatives, says the firm. A global manager with an international background, he has a track record in driving growth, leading complex projects, and delivering innovative solutions specifically for defense, public safety, and critical infrastructure clients. His expertise spans advanced laser and optical technologies, secure communications, and international expansion, with a focus on the defense market. Before joining NUBURU, Barisoni held senior leadership positions at leading European technology firms, where he focused on defense-related projects and advised public companies on M&A and internationalization initiatives, including those within the defense industry.

Zamboni has extensive expertise in capital markets and technology, especially in fintech and regulatory technology sectors. He has a background in the innovation marketplace and was a founding member of DEVOLab, SDA Bocconi's think-tank focused on digital transformation. DEVOLab partners with MIT's Design Lab to scout emerging technological trends and bring a frontier perspective to its research. In this context, Zamboni also founded multiple startups. His leadership plays a role in shaping NUBURU's strategic vision and fostering long-term value creation.

www.nuburu.net

NYSE American warns NUBURU for not providing advance notification of dual-CEO announcement

NUBURU has received a warning letter from NYSE American LLC regarding its compliance with Section 401(a) of the NYSE American Company Guide.

The warning letter relates to NUBURU's 1 October press release announcing the implementation of a dual-CEO structure to drive its transformation plan. NYSE American determined that NUBURU did not provide the required advance notification to it prior to the issuance of this release, as stipulated by Section 401(a) of the Company Guide for material news announcements made during trading hours.

NUBURU acknowledges the concerns and is taking steps to enhance its procedures for disseminating material information to ensure future compliance with the Company Guide.

In accordance with Section 401(j), NUBURU is disclosing this warning letter publicly.

STARLight project chosen for EU CHIPS funding

ST-led consortium to develop 300mm silicon photonics technology

Led by STMicroelectronics of Geneva, Switzerland, the STARLight consortium — consisting of 24 technology companies and universities from 11 countries in the European Union — has been selected by the European Commission under the EU CHIPS Joint Undertaking initiative.

The project STARLight (300mm Silicon Technology for Applications Relying on Light with Photonics Devices) brings together a consortium of industrial and academic partners to position Europe as a technology leader in 300mm silicon photonics (SiPho) technology by establishing a high-volume manufacturing line, developing leading-edge optical modules, and fostering a complete value chain. From now until 2028, STARLight aims to develop application-driven solutions focusing on key industry sectors such as data centers, AI clusters, telecommunications, and automotive markets.

"Silicon photonics technology is critical to put Europe at the crossroads to the AI factory of the future and the STARLight project represents a significant step for the entire value chain in Europe, driving innovation and collaboration among leading technology companies," says Remi El-Ouazzane, president, Microcontrollers, Digital ICs and RF products Group at ST.

Addressing key challenges

The development of advanced photonic integrated circuits (PICs) will tackle several challenges:

- high-speed modulation: creating highly efficient modulators capable of operating at speeds exceeding 200Gbps per lane is a key focus;
- laser integration: developing efficient and reliable on-chip lasers is critical for integrated systems;
- new materials: various advanced materials will be explored with actors like SOITEC, CEA-LETI, imec, Université Paris-Saclay, III-V Lab, Lumiphase, and integrated on a single innovative silicon photonics platform, such as silicon-on-insulator (SOI), lithium niobate (LNOI), and barium titanate (BTO);
- packaging and integration: optimizing the packaging and integration of PICs with electronic circuits is essential to optimize signal integrity and minimize power consumption.

Applications-based innovations

- Datacenters/Datacom —

The STARLight project has an initial focus to build datacom demonstrators for data centers, based on PIC100 technology, capable of handling up to 200Gb/s with key actors including ST, SICOYA and THALES. It will also develop prototypes for free-space optical transmission systems, designed for both space and terrestrial communication. Additionally, the project will leverage the multi-disciplinary experience of major contributors to shape the research effort towards a 400Gbps-per-lane optical demonstrator using new materials, targeting the next generation of pluggable optics.

- Artificial intelligence (AI) —

The project aims to develop a cutting-edge photonic processor optimized for tensor operations, such as matrix vector multiplication and multiply-accumulate, with superior characteristics in terms of size, data-processing speed, and energy consumption compared with existing technologies. Since neural networks — the core algorithms behind AI — rely heavily on tensor operations, enhancing their efficiency is critical for AI processing performance.

- Telecommunications —

The project plans to develop and showcase silicon photonic devices specifically designed for the telecoms industry. Ericsson will focus on two concepts to improve mobile network efficiency. The first involves the development of an integrated switch to enable optical offload within radio access networks, allowing for more efficient handling of data traffic. The second concept explores radio-over-fiber technology to relocate power-intensive processing ASICs away from antenna units, providing enhanced capacity and savings in embodied CO2. Additionally, MBRYONICS will develop a free space-to-fiber interface at the reception of free space optical (FSO) communication.

- Automotive/sensing —

The project will also demonstrate how it performs in sensing applications, and the close relationships of LiDAR sensor maker STEERLIGHT with leading car manufacturers will help make this an industrial reality. Within the project, THALES will develop sensors that accurately generate, distribute, detect and process signals with intricate waveforms to demonstrate key functionalities. More broadly, the outcomes of this project are also intended to benefit the wider ecosystem of indoor and outdoor autonomous robot manufacturers.

The STARLight consortium members acknowledge co-support from the European Union and their respective national authorities.

The complete list of participants in the STARLight consortium is: Aixscale Photonics; Almae Technologies; Ansys; Aristotelio Panepistimio el y Thessalonikis (AUTH); French Alternative Energies and Atomic Energy Commission (Commissariat à l'énergie atomique et aux énergies alternatives, CEA); Design and Reuse (D&R); Ericsson; Helic Ansys Hellas Monoprosoph AE; III-V Lab; Interuniversitair Micro-Electronica Centrum (IMEC); Keysight Technologies; Knowledge Development for Pof S.L.; Lumiphase; MBRYONICS; NVIDIA; NcodiN; Die Rheinisch-Westfälische Technische Hochschule Aachen (RWTH Aachen); Sicoya; SOITEC; STEERLIGHT; STMicroelectronics; THALES; Università degli Studi di Pavia; Université Paris-Saclay.

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C-PIC launches Open Platform GitHub repository

CORNERSTONE facilitates translation of silicon photonics research into scalable, industry-ready solutions

At the European Conference on Optical Communication (ECOC 2025) in Copenhagen, Denmark (29 September–1 October), CORNERSTONE Photonics Innovation Centre (C-PIC) — formed in 2014 and the UK's dedicated Innovation and Knowledge Centre (IKC) for silicon photonics (SiPh) prototyping foundry (affiliated with the University of Southampton and the University of Glasgow, as well as the UK government's Science and Technology Facilities Council) — unveiled its new Open Platform.

Building on its long-standing commitment to open access, C-PIC is enabling true open-source collaboration by making its CORNERSTONE Foundry-compatible SiPh process design kits (PDKs), components, and building blocks available via its Open Platform GitHub.

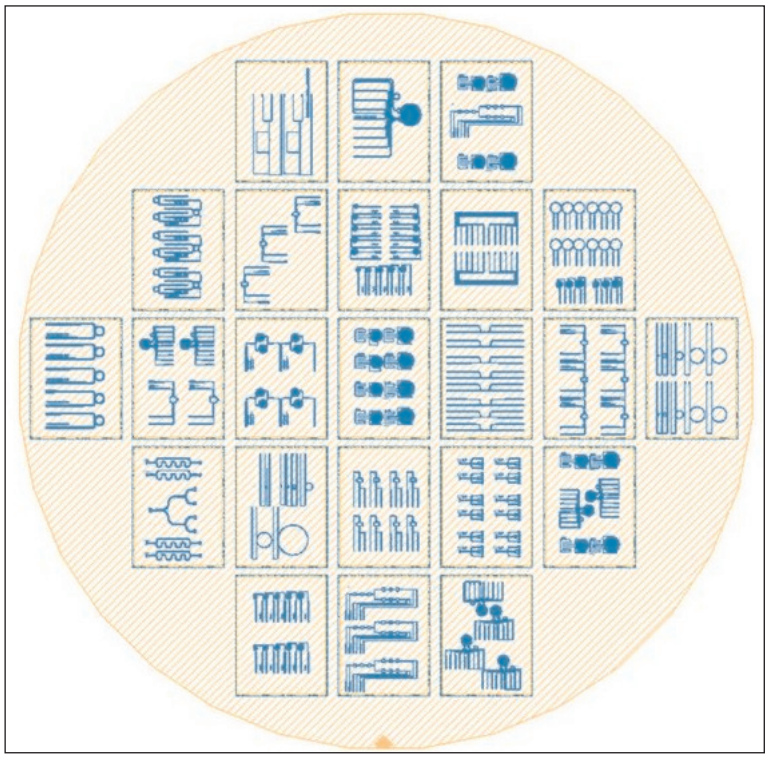
As well as allowing access to C-PIC's information, the platform will support contributions from the wider community, allowing researchers, individuals and commercial organizations to upload and reuse trusted design elements. By providing open access to these elements in a single, easy-to-access environment, the Open Platform shortens design cycles and creates an ecosystem where innovation can be shared and scaled rather than reinvented.

The first CORNERSTONE Foundry compatible releases are:

- SOI 220nm active PDK — silicon-on-insulator (SOI) platform for high-speed modulation, used in CORNERSTONE's all-silicon transmitter, suitable for datacom and telecom applications; and
- SiN 300nm PDK — silicon nitride platform supporting datacom, quantum technologies, biosensing, and space applications.

Additional C-PIC platforms will follow, including:

- Germanium-on-Silicon (Ge-on-Si) — designed for mid-infrared sensing, abri-tech, and space applications;
- Suspended Silicon (Suspended Si) — suitable for gas and environmental monitoring;
- SOI 340 nm — suited to datacom and telecom applications;
- SOI 500nm — developed for high-power defence applications; and
- SiN 200nm — supports visible light range for biosensing applications.



Wider community contribution

Alongside C-PIC's own contributions, the Open Platform will feature at launch content from the wider community that is compatible with the CORNERSTONE Foundry. Contributors include Compound Semconductor Applications (CSA) Catapult, Ireland's Tyndall National Institute, and individuals from leading universities such as the University of Pavia (Università di Pavia) and the University of Sheffield. Early uploads range from educational kits and discrete components to complete circuit designs, demonstrating strong adoption by both academic and commercial users.

Beyond PDKs, the platform also supports Open Data, covering simulation and test results. This area is predicted to expand significantly moving forward, and new resources intended to dramatically improve SiPh innovation will be added in the future, reflecting C-PIC's roadmap towards a comprehensive open-source ecosystem.

Open Platform available now

"The Open Platform represents a significant milestone in open-source photonics," says Dr Emre Kaplan, PDK manager at C-PIC. "By enabling the sharing of photonic integrated devices and circuits we can help users accelerate research and industry innovation, allowing the photonics community to build on each other's work rather than starting from scratch."

C-PIC also acknowledges the support of the UK Engineering and Physical Sciences Research Council (EPSRC) Impact Acceleration Account and the University of Southampton, whose funding has helped bring the Open Platform to life.

The Open Platform is now live on GitHub, providing a central hub for the photonics community to explore, contribute and accelerate the development of SiPh technologies.

https://github.com/cornerstone-uos/cornerstone-community
www.cornerstone.sotonfab.co.uk

Ayar appoints Vivek Gupta as chief strategy officer to lead hyperscaler collaborations and accelerate CPO adoption

Former Google & Qualcomm executive joins to expand partnerships and advance optical solutions for next-gen AI data centers

Silicon photonics-based chip-to-chip optical connectivity firm Ayar Labs of San Jose, CA, USA — which is pioneering co-packaged optics (CPO) for large-scale AI workloads — says that Vivek Gupta has joined as its first chief strategy officer (CSO). This comes as the industry transitions to next-generation AI architectures that demand the bandwidth, latency and efficiency benefits enabled by CPO.

"This is a momentous time for the company, as we scale to commercial production and strengthen customer partnerships," says CEO & co-founder Mark Wade. "Vivek's proven ability to guide emerging technologies through complex industry inflection points, along with his experience building executive relationships in the hyperscale ecosystem, will be instrumental in advancing our mission to make optics a key enabler for the future of AI."

Vivek Gupta.

Gupta will oversee Ayar's global strategy, customer engagement, and product functions to drive market adoption of optical I/O. This includes developing relationships with hyperscale customers as well as leading go-to-market and product strategies. He will work closely with the CTO, engineering and commercial teams to ensure that Ayar Labs continues to deliver innovative, customer-centric solutions for AI data centers, says the firm.

"CPO is no longer just a breakthrough technology, it's foundational for large-scale AI data centers to drive the power efficiency and performance required for AI roadmaps," says Gupta. "Success at this inflection point requires creative customer co-development, bold new business models and go-to-market strategies, and a steadfast focus on customer value."

Gupta brings over two decades of experience leading business strategy, commercialization and product innovation at global technology leaders including Google, Qualcomm and Atheros. He is recognized for building executive relationships, launching disruptive solutions in complex technology markets, and driving the adoption of emerging compute architectures across leading global organizations.

His appointment follows significant progress at Ayar Labs, including a collaboration with Alchip Technologies to scale AI infrastructure with CPO and continued expansion of the company's executive team, customer base, and global presence.

www.ayarlabs.com

Photon Design exhibits product range at ECOC 2025

Updates include the Multi-Topology FIMMPROP simulator, a quantum dot module option for the HAROLD laser simulation tool, and enhanced OmniSim performance

Photonic simulation CAD software developer Photon Design Ltd of Oxford, UK exhibited at the European Conference on Optical Communication (ECOC 2025) in Copenhagen, Denmark (28 September–2 October).

"Since last year's ECOC exhibition, Photon Design has prioritized product development; added application engineering roles to the staff team; developed the website and social media presence; and delivered a wide range of seminars and product training sessions, leading to greater awareness of the company and growth," notes CEO Dr Dominic Gallagher.

"Key updates to our product range include the Multi-Topology (MT)-FIMMPROP simulator, which models industry-leading PICs [photonic integrated circuits] and passive waveguide devices and design flows, in a unified environment, using our proprietary EigenMode Expansion (EME) model. We have a quantum dot module option for our HAROLD laser simulation tool ready to release, which is for modelling epitaxy structures in quantum dot lasers. Finally, we have enhanced OmniSim performance, which simulate complete device designs, such as for 3D surface grating couplers. OmniSim delivers rigorous results using our FDTD [finite-difference time-domain] model; and is up to five times quicker than our competitors," he adds.

"We have also implemented a broad training and seminar program for customers; launched a new photond.com website platform and customer information portal; and we have expanded our Oxford team to include application engineers. This is to support customers and capture product feedback, ensuring our next-generation simulation products remain at the forefront of the industry."

www,photond.com

POET raises US$75m from institutional investor

Proceeds to be used for targeted acquisitions, scaling up R&D, and acceleration of the light source business for AI hardware

POET Technologies Inc of Toronto, Canada — designer and developer of the POET Optical Interposer, photonic integrated circuits (PICs) and light sources for the hyperscale data-center, telecom and artificial intelligence (AI) markets — has closed a non-brokered financing with a single institutional investor. In a private placement, the firm issued and sold 13,636,364 common shares and one common share purchase warrant (at a combined price of US$5.50 each) for gross proceeds of US$75m, before deducting related expenses.

Representing the largest single investment in its history, POET intends to use the net proceeds for corporate development, including targeted acquisitions, scaling up of R&D, acceleration of the light source business, expanding operations and general working capital.

"The massive growth of AI infrastructure represents an unprecedented opportunity for which POET is well prepared," says executive chairman & CEO Dr Suresh Venkatesan. "Our base thesis has always been to provide a flexible integration platform for cutting-edge technologies and to scale those advanced solutions rapidly and economically," he adds. "With a war chest of over US$150m in cash and no significant debt, we are now able to scale up our own growth ambitions in the market for advanced AI hardware solutions. This includes investments and targeted acquisitions to secure our technological lead and revenue-generating opportunities in light sources for chip-to-chip connectivity, ultra-high-speed transceivers and related applications."

www.poet-technologies.com

POET and Semtech launch 1.6T optical receivers for AI networks

Optical Interposer platform integrates FiberEdge technology to boost sensitivity and power efficiency at 200G per lane

POET Technologies has announced with high-performance semiconductor, Internet of Things (IoT) systems and cloud connectivity service provider Semtech Corp of Camarillo, CA, USA the immediate availability for customer sampling of high-performance 1.6T receiver optical engines for AI and cloud networks.

The optical engine products leverage POET's Optical Interposer platform to integrate Semtech's FiberEdge 200G-per-lane receiver technologies, creating highly integrated, chip-scale receive (Rx) engines that simplify module assembly while improving performance and manufacturability. The optical engines include DR8 for short-reach AI cluster links and 2xFR4 for longer-reach intra-data-center connectivity and are available now for customer sampling.

"By integrating Semtech's leading 200G-per-lane receiver technology with POET's chip-scale optical interposer, we've achieved exceptional receiver performance that addresses the most demanding requirements for AI and cloud networks," claims POET's chief revenue officer Raju Kankipati. "We expect customers will quickly understand the market impact these products can make on their transceiver offerings and the resulting benefit to their customers. This collaboration also further deepens POET's presence in the global high-speed optical transceiver ecosystem," he adds.

"Delivering 200G-per-lane performance with the power headroom system designers need is fundamentally a signal-integrity challenge," says Amit Thakar, VP of Signal Integrity product marketing at Semtech. "By co-optimizing our FiberEdge receive path with the POET Optical Interposer at the architecture and assembly levels, we're achieving exceptional sensitivity and power in 1.6T DR8 and 2xFR4 receiver engines now sampling to customers."

Integrated platform delivers advanced performance

The collaboration demonstrates how POET's Optical Interposer platform enables seamless integration of high-performance electronic and photonic components with Semtech's tested FiberEdge technology, delivering:

- Nx200G/lane: receive path using Semtech FiberEdge transimpedance amplifiers (TIAs), integrated on POET's Optical Interposer for compact, chip-scale assembly.
- Module targets: 1.6T DR8 and 2xFR4 receiver engines for AI cluster and intra-DC links. The 2xFR4 Receiver Optical Engines comes with integrated demultiplexers.
- Integration advantages: lower power, higher sensitivity, reduced BOM and assembly steps, and improved electrical/optical signal integrity at 200G/lane.

Evaluation units of the 1.6T DR8 and 2xFR4 receiver optical engines are available for qualified customers.

www.semtech.com

POET and Sivers collaborate on external light sources for co-packaged optics and next-gen AI market

High-power DFB laser technology to combine with Optical Interposer

POET Technologies has announced a strategic collaboration with Sivers Semiconductors AB of Kista, Sweden (which supplies RF beam-former ICs for SATCOMs and photonic lasers for AI data centers) to develop high-performance and cost-effective external light source (ELS) modules tailored for co-packaged optics (CPO) and next-generation AI infrastructure.

The collaboration combines Sivers' customized high-power distributed feedback (DFB) laser technology with POET's Optical Interposer platform, enabling a highly integrated scalable and cost-optimized solution for the rapidly growing demands of AI clusters and hyperscale data centers.

"We see a highly complementary fit between our high-performance DFB lasers and POET's innovative optical interposer platform," says Sivers Semiconductors' CEO Vickram Vathulya. "Together, we aim to deliver a new class of external light source modules that address key technical challenges in co-packaged optics and enable our customers to scale efficiently into the AI-driven future."

The jointly developed modules will leverage advanced wafer-level manufacturing and chip-scale photonic integration to address critical challenges in both scale out and scale up deployments such as cost, scale and form factor.

"POET's Optical Interposer has demonstrated tremendous value in enabling modular and scalable photonic solutions," says POET's executive chairman & CEO Dr Suresh Venkatesan. "By working with Sivers' proven high-power laser technology, we can deliver external light source modules optimized for size, performance and cost — exactly what the CPO and AI markets demand," he adds.

"We estimate that the AI optical connectivity opportunity has created over $50bn in market value to date, with the emerging market for ELS supporting scale-up CPO solutions set to add significantly to that," says Tim Savageaux, senior analyst at Northland Capital Markets. "The POET–Sivers collaboration brings technologies together to address an estimated $1bn+ annual ELS market opportunity and is a primary driver of our research coverage of both companies."

POET and Sivers expect to demonstrate early prototypes to customers in first-half 2026, and production readiness by end-2026.

www.sivers-semiconductors.com

POET wins 'Most Innovative' Award at ECOC 2025

Firm recognized for POET Optical Interposer and applications including 200G/lane receive and transmit optical engines

POET Technologies won in the 'Most Innovative Chip-scale Packaging/ Optical Sub Assembly Product' category at the ECOC Awards.

Chief revenue officer Raju Kankipati accepted the award during ceremonies held at the European Conference on Optical Communication (ECOC 2025) in Copenhagen, Denmark (29 September–1 October). It is the seventh notable award POET has earned in the past 15 months for its applications that are positioned to serve the demand for more compute power from artificial intelligence developers and datacom hyperscalers.

"Such recognition builds on the momentum we are seeing from technology experts and our growing customer base," says executive chairman & CEO Dr Suresh Venkatesan. "Being recognized for having the most innovative chip-scale packaging at a time when the industry is searching for solutions to satisfy AI systems networks and data-center hyperscalers will only result in more interest in POET and our commercial-ready products."

POET's Raju Kankipati accepts the ECOC Award from Optica board member Michael Lebby.

Launched in 2020, the ECOC Awards honor the "most innovative and influential achievements in optical communications". The awards highlight "ground-breaking advancements in optical transport, networking, fiber-based products, photonic integrated circuits, and related technologies".

The firm was recognized for its highly integrated platform technology, the POET Optical Interposer, and its applications that include 200G/lane receive and transmit optical engines. The company's 1.6T line of optical engines, POET Teralight, was the topic of a Product Focus discussion at the ECOC Exhibition.

www.ecocexhibition/industry-awards.com

www.poet-technologies.com/

Lumentum gives live technology and product demos

New products targeted at AI and data-center networks

At the European Conference on Optical Communication (ECOC 2025) in Copenhagen, Denmark (29 September–1 October), Lumentum Holdings Inc of San Jose, CA, USA (which designs and makes optical and photonic products for optical networks and lasers for industrial and consumer markets) gave several live technology and product demonstrations, reinforcing its focus on enabling AI-driven data centers and the world's largest communications networks.

Live demonstrations during the exhibition included the following:

ELSFP transceivers for CPO architectures

Lumentum is showcasing its development of external laser source (ELS) modules in the ELSFP pluggable form factor, designed to advance co-packaged optics (CPO) architectures in high-bandwidth environments such as hyperscale data centers and AI clusters. The demonstration highlights pluggable modules incorporating Lumentum's ultra-high-power (UHP) 1310nm lasers, enabling next-generation switches and AI processors with integrated optical connectivity. By separating the laser source from the optical engine and placing it at the system faceplate, these modules improve thermal management and reliability, while their design enhances serviceability and modularity.

The ELSFP form factor provides higher system density, lower thermal loads, and improved lifetime performance, all while maintaining standards compliance. This product is expected to be sampling in first-quarter 2026.

1.6T DR8 TRO OSFP transceiver for cloud and AI applications

Lumentum also demonstrated its 1.6T DR8 TRO OSFP pluggable transceiver module, which provides 8x200Gbps data connectivity over 500m of single-mode fiber optics targeting hyperscale cloud and AI applications. Its TRO ('Transmit-Retimed Optical') design offers significantly lower power dissipation compared with a fully retimed optical (FRO) transceiver module. The product leverages internal Lumentum manufacturing and components and is currently ramping into volume production.

Extended C+L ultrawideband Nano-iTLA now sampling

In addition, Lumentum is sampling its ultrawideband narrow-linewidth InP nano-iTLA. This new laser assembly provides full tunability across more than 12.4THz, covering both the extended C- and L-bands, making it suited to supporting the increased bandwidth demand driven by AI data centers, data-center interconnects (DCI), metro, and long-haul networks. Building on Lumentum's proven external cavity laser (ECL) technology, the ultrawideband nano-iTLA is delivered in the same compact form factor as existing solutions, with a single wideband tunable laser. It offers what is claimed to be best-in-class narrow-linewidth performance, enabling superior signal integrity and system reach. Initial units have been delivered to key customers for evaluation in next-generation optical networks.

"As AI and cloud workloads accelerate at an unprecedented pace, the need for faster, more scalable optical solutions has never been greater," says Rafik Ward, chief strategy & marketing officer. "With our latest innovations, Lumentum is shaping the future of network infrastructure and empowering customers to build the data centers and AI networks of tomorrow."

www.ecoc2025.org
www.lumentum.com

Lumentum presentations at ECOC 2025

Speakers share insights on AI innovations, transceiver performance breakthroughs, and next-generation transport optimization

Lumentum Holdings Inc of San Jose, CA, USA (which designs and makes optical and photonic products for optical networks and lasers for industrial and consumer markets) has announced its speaker line-up for the European Conference on Optical Communication (ECOC 2025) at the Bella Center in Copenhagen, Denmark (28 September–2 October).

Lumentum representatives (from its Cloud and Networking segment) include:

- Matt Sysak (chief technology officer)
  — ECOC panelist: Workshop 9: 'AI Interconnect Dilemma: Which Technology Is Doomed – VCSELs or Silicon Photonics?';
- Simon Warren (senior director, product line management)
  — Market Focus speaker: 'Optimizing Transport Components for Multi-Rail Line System Architectures';
- Kazuhiko Naoe (R&D director)
  — ECOC speaker: Workshop 10: 'High Symbol-rate Transceivers - How to get to the pinnacle of performance?';
- Selina Farwell (senior principal engineer)
  — chair, ECOC Subcommittee 2: 'Discrete Photonic Devices and Technologies';
  — organizer, Workshop 2: 'AI-Driven Innovations in Photonic Device Design, Fabrication, Testing, and Integration';
  — Session chair: 'PCSELs, VCSELs and EML'.

Marvell showcasing interconnect portfolio for accelerated infrastructure at ECOC

Full-stack innovation across optics, advanced silicon and memory to power AI scale-up and scale-out data-center deployments

At the European Conference on Optical Communication (ECOC 2025) in Copenhagen, Denmark (28 September–2 October), data infrastructure semiconductor solutions provider Marvell Technology Inc of Santa Clara, CA, USA showcased its interconnect portfolio for scale-up and scale-out data-center AI deployments.

The rapid evolution of generative AI technologies and large-scale models is redefining data-center architectures, driving unprecedented demand for interconnect performance, bandwidth and power efficiency, notes Marvell. This transformation is accelerating the need for high-performance silicon, advanced memory architectures and tightly integrated optical connectivity. As hyperscalers scale massive AI compute clusters across racks, campuses and multi-site topologies, interconnect technologies must be developed to deliver efficiency, scalability and workload-optimized performance.

Marvell is addressing this challenge with a full-stack approach — combining advanced silicon platforms, chiplet-based architectures and optical technologies. Together, these innovations are said to unlock new levels of performance across scale-up and scale-out fabrics, reduce latency, lower power consumption, and enable faster deployment at cloud scale.

At ECOC, Marvell showcased technologies that will drive the next generation of AI interconnects, including:

- Co-packaged optics (CPO) for AI scale-up: a CPO platform supporting 200G/lane connectivity for energy-efficient, high-bandwidth links spanning multiple racks within an AI scale-up domain.
- Marvell COLORZ 800G ZR/ZR+ for multi-site AI training: an industry-first family of 800Gbps ZR/ZR+ coherent pluggable optical modules that supports transmission up to 2000km, enabling cost-effective, scalable data-center interconnect (DCI) between geographically distributed AI clusters.
- 200G/lambda 1.6T PAM4 optical interconnect: Marvell Ara, the industry-first 3nm PAM4 DSP, combines eight 200Gbps channels inside a single optical module, enabling rapid deployment of AI scale-out fabrics across rows and data halls.

Marvell experts also delivered presentations on interconnect technologies designed to scale accelerated infrastructure:

- Market Focus: 'Outlook for Coherent Lite Technologies and Markets' by Bo Zhang (senior principal engineer, Marvell);
- Product Focus: '800G Coherent DSP and Beyond' by Bo Zhang (senior principal engineer, Marvell);
- Product Focus: 'Revolutionizing Rackscale Connectivity Using Co-packaged Copper & Optics' by Rohan Gandh (product management, Switch, at Marvell) and Matthew Burns (director of technical marketing, Samtec);
- 'Impact of Equalizer-Enhanced Phase Noise for Coherent Pluggables' by Hai Xu (distinguished engineer).

www.ecoc2025.org
www.marvell.com

TRUMPF unveils 850nm multimode 100G datacom VCSEL

In a live demo at the European Conference on Optical Communication (ECOC 2025) in Copenhagen, Denmark (29 September–1 October), TRUMPF Photonic Components GmbH of Ulm, Germany (part of the TRUMPF Group) unveiled its new 100G vertical-cavity surface-emitting laser (VCSEL).

The 850nm multimode 100G datacom VCSEL features what is claimed to be excellent bandwidth and linearity over temperatures up to 85ºC, making it suitable for use in 800G SR8 and 400G SR4 active optical cables (AOCs) and transceivers, including linear pluggable optics (LPO). The VCSEL is designed to be a drop-in replacement for existing solutions with substrate thicknesses of 150μm and 200μm. The accompanying wideband photodiode provides further opportunity to optimize the performance when used as matching pair with the VCSEL.

TRUMPF is offering the 100G VCSELs in singlets, 1x2, 1x4, 1x8 and 1x12 arrays. (photo courtesy of © TRUMPF).

TRUMPF already offers a 100G photodiode with wide bandwidth spanning 842–948nm wavelengths, enabling high-performing short-reach optical links for existing datacom needs.

"With competitive 100G VCSEL and PD in our portfolio, we are now optimizing our state-of-the-art production lines to ensure high-volume supply," says VP of marketing & sales Ralph Gudde. "Simultaneously, we are also solidifying the progress on 200G 850nm, longer wavelengths like 1060nm and subwavelength gratings," he adds.

Advanced optical data communication systems benefit from the high-speed data transmission that the VCSEL-based technology offers, says TRUMPF. The firm adds that it continues to invest heavily in its technology for higher data rates and is offering both VCSELs and photodiodes as a matching-pair solution in various layouts like singlets, 1x2, 1x4, 1x8 and/or 1x12 arrays.

The VCSELs are specifically designed to meet the requirements of data centers, including for AI/ML, high-performance computing (HPC), and other bandwidth-intensive applications for stable and reliable data transmission at high speeds.

www.ecoc2025.org
www.trumpf.com
/s/VCSEL-solutions

TRUMPF demos linear performance of 850nm 100G VCSEL and photodiode in Optomind's transceiver

At ECOC 2025, TRUMPF Photonic Components showcased linear performance of its new PAM4 100Gbps, 850nm multimode VCSEL in collaboration with customer Optomind Inc of Suwon, South Korea, which provides optical interconnect solutions for data centers including artificial intelligence (AI) and high-performance computing (HPC) networks. Along with the VCSEL, TRUMPF also offers a 100G wideband (842–948nm) photodiode that can be used to further optimize the link.

"TRUMPF's 100G VCSEL's excellent linearity over a wide temperature range, paired with TRUMPF's 100G photodiode, enable solid performance and extra design margins, yielding a superior transceiver design," comments Optomind's chief marketing officer Yung Son. "We look forward to further strengthening our already cutting-edge products with new technologies in collaboration with TRUMPF," he adds.

"Our continuing partnership with Optomind, which allows us to validate the benefits of our new technologies in a real-world application, is immensely valuable to us," comments TRUMPF's VP of marketing & sales Ralph Gudde. "We will continue to work together in the future towards developing new products based on our devices featuring innovative technologies such as higher data rate, longer wavelengths and subwavelength grating."

Advanced optical data communication systems benefit from the high-speed data transmission that the VCSEL-based technology offers, says TRUMPF. For interconnect distances of up to 100m, VCSELs are the best solution in terms of power, cost and the productivity of SR modules. TRUMPF is offering both VCSELs and photodiodes as a matching-pair solution, in singlets, 1x4 arrays and 1x12 arrays for 14G and 25G for NRZ applications. The same is offered for 56G PAM4 applications and now for the 100G PAM4 VCSEL. The VCSELs are specifically designed and implemented to meet the requirements of hyperscale data centers including demands for AI/ML applications, high-performance computing systems (HPC), and other bandwidth-intensive applications, as they deliver high performance and reliable data transmission at high speeds.

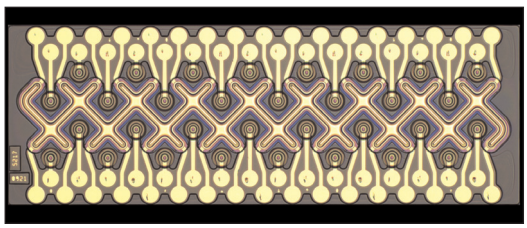
www.optomindinc.com
www.ecoc2025.org
www.trumpf.com
/s/VCSEL-solutions

Coherent introduces 2D VCSEL and photodiode arrays

Arrays enable power-efficient and compact links optimized for short-reach 'slow and wide' interconnections in scale-up AI networks

Materials, networking and laser technology firm Coherent Corp of Saxonburg, PA, USA has announced what it reckons is a breakthrough in short-reach optical interconnect technology with the demonstration of its next-generation 2D vertical-cavity surface-emitting laser (VCSEL) and photodiode (PD) arrays. Best suited for 'slow and wide' interconnections in scale-up AI networks, the arrays enable power-efficient and compact links optimized for short reach, addressing the surging data traffic demands in modern data centers.

Leveraging its proven 100G PAM4 multimode VCSEL and PD platform, Coherent has introduced a high-density 2D array architecture



(1.6T, 850nm, 32x50G NRZ) that enables copper link replacement and optimal degree of parallelism. With advantages in low power consumption, reduced latency, and cost efficiency, the arrays are designed to support the transition to near-packaged optics (NPO) and co-packaged optics (CPO), accelerating deployment of AI/ML workloads in hyperscale data centers.

"We are continuously anticipating the needs of next-generation data-center interconnects," says Karlheinz Gulden, senior VP, Laser and Subsystems at Coherent. "Our high-density multimode 2D VCSEL and PD arrays represent an important step forward in enabling parallelism, power-efficient design, and flexible architectures that will shape the future of AI and machine learning networks."

As an initial step toward enabling high-performance AI/ML scale-up links, Coherent will introduce 1060nm backside-emitting (BSE) flip-chip VCSEL/PD array variants in 2026, expanding its product portfolio for next-generation optical networking.

www.Coherent.com

Ascent Solar and Defiant Space partner on global defense & national security and space market opportunities

Ascent's space-proven solar technology to combine with Defiant's ability to develop and integrate mission-focused space solutions

Ascent Solar Technologies Inc of Thornton, CO, USA — which designs and makes lightweight, flexible copper indium gallium diselenide (CIGS) thin-film photovoltaic (PV) modules that can be integrated into consumer products, off-grid applications and aerospace applications — has announced a strategic partnership with Defiant Space Corp, an emerging space company focused on scalable solutions for the defense and national security market.

The firms will pursue opportunities in the US defense and national security sectors, combining Ascent's space-proven solar technology with Defiant's ability to develop and integrate mission-focused space solutions. The collaboration is designed to address the growing demand for resilient, cost-effective capabilities supporting defense and security objectives.

In addition, Ascent and Defiant will collaborate to explore opportunities across allied and international space markets, including NATO and Five Eyes partner nations. By combining Defiant's strategic relationships with Ascent's proprietary thin-film solar technology, the companies aim to identify areas where advanced US solar solutions can contribute to shared defense, security and commercial initiatives.

The firms will pursue opportunities in the US defense and national security sectors, combining Ascent's space-proven solar technology with Defiant's ability to develop and integrate mission-focused space solutions

"Partnering with Defiant neatly aligns with Ascent's mission to deliver lightweight, flexible and highly durable solar solutions to the most demanding markets," says Ascent Solar's CEO Paul Warley. "By combining our technology with Defiant's platforms, we are strengthening our role in US national security initiatives and opening new commercial pathways for Ascent," he adds.

"Defiant is focused on developing scalable solutions that strengthen the defense and national security market," says Defiant Space's chief strategy officer Jeromy Grimmett. "By working with Ascent Solar, we can advance innovative technologies that align with critical mission needs while also creating new opportunities abroad for US-developed space capabilities."

The partnership reflects the growing importance of resilient, dual-use space technologies in both government and commercial domains. By aligning their capabilities, Ascent and Defiant reckon that they are well positioned to serve the rapidly expanding $1 trillion global space economy projected by 2040.

www.defiantco.com
www.AscentSolar.com

Ascent delivers thin-film PV test samples to ocean monitoring firm and space power lasing company

Technology to be tested for saltwater environment durability and space-based power beaming receiving capabilities

Ascent Solar has delivered test samples of its thin-film PV technology to both an ocean monitoring technology company (a developer of autonomous underwater vehicles capable of reaching anywhere in the ocean with a high degree of speed, endurance and sensing) and a space power lasing company (focused on advancing space and defense technologies).

With these test deliveries, Ascent says that it continues to push the limits of its solar technology in extreme environments. The ocean monitoring company will test the technology's functionality and durability in aquatic terrestrial applications, with the intent of enabling persistent equipment operation of ocean-based monitoring technologies. The space power lasing company will test the technology's space-based power beaming receiving capabilities, as it seeks out technologies that enable the transmission of power between satellites on orbit.

"We see underwater and space applications as unique opportunities for thin-film PV to thrive, as the technology's lightweight, flexible and durable design allows it to withstand the immense pressures and tempestuous conditions that define these environments," says CEO Paul Warley. "Our team looks forward to reviewing the findings from each of these tests, as we aim to unlock thin-film solar technology's potential in both markets."

Ascent signs MoU with Star Catcher Industries to improve power capabilities for thin-film solar technology in space

Ascent Solar Technologies Inc of Thornton, CO, USA — which designs and makes lightweight, flexible copper indium gallium diselenide (CIGS) thin-film photovoltaic (PV) modules that can be integrated into consumer products, off-grid applications and aerospace applications — has signed a memorandum of understanding (MoU) with Star Catcher Industries Inc of Jacksonville, FL, USA, which is pioneering the first space energy grid, to achieve mutually beneficial goals that would aid the proliferation of thin-film PV solutions in space environments.

Star Catcher is creating the first-of-its kind space-to-space power beaming service. By transmitting concentrated solar energy to clients' existing onboard solar arrays — with no retrofit required — it provides satellite operators with up to 5–10 times more power. When combined with Ascent's thin-film solar solutions optimized for use in space on satellites and other spacecraft, Star Catcher customers will gain access to space solar technology, bolstered by the reliability of its space energy grid.

Ascent will explore the following in partnership with Star Catcher:

- Power augmentation for Ascent customers: Integrating Star Catcher's beamed energy to provide Ascent's customers with continuous augmented power, even during high-demand operations.
- Power availability amid outages: Star Catcher's platform can aid Ascent's customers during outages, such as eclipses or power failure, ensuring uninterrupted operations.
- Bundled solutions for joint customers: Offering joint power solutions that seamlessly intertwine Ascent's thin-film PV technology with Star Catcher's power augmentation capabilities.
- Joint Demonstration Missions: Collaborating on ground or in-space demonstrations to test and showcase the capabilities of the combined technologies

"Working in tandem with Star Catcher opens up several new possibilities and market opportunities for Ascent," reckons Paul Warley, CEO of Ascent Solar. "Our companies will be able to tackle joint customer and mission objectives," he adds. "Beyond that, this marks an incredible chance for our companies to further work toward the proliferation of improved solar solutions in orbit to meet growing demand for next-generation power solutions."

www.star-catcher.com
www.AscentSolar.com

Ascent teaming with Emtel Energy USA to advance thin-film PV energy storage capabilities

Ascent Solar Technologies has signed a teaming agreement with Emtel Energy USA, a provider of graphene-based electrostatic long-duration energy storage (ELDES). The agreement is intended to achieve mutually beneficial goals that would advance Emtel Energy's energy storage capabilities and aid the proliferation of thin-film PV solutions in space environments.

Emtel Energy has developed a high-agility solid-state graphene battery alternative that circumvents the concerns about low energy density and swift degradation that plague flow batteries. The durable power storage technology, paired with Ascent's thin-film PV, is expected to be instrumental in powering satellites, spacecraft and other space architecture.

"The Department of Defense and Space Force are in great need of durable, reliable energy production and storage technologies that can withstand the punishing elements of space," says Ascent's CEO Paul Warley. "Our lightweight, flexible thin-film PV, combined with Emtel Energy's long-lasting energy storage technology, creates an ideal offering for these organizations as they seek out solutions that will stick around for the long haul while they continue to build out their space vehicle infrastructure."

www.emtelenergyusa.com

Quantum cascade lasers on a mid-infrared silicon photonic platform

Devices have achieved a T_0 characteristic temperature of 180K, comparable to state-of-the-art devices on native III-V substrates.

Université Grenoble Alpes and Université Claude Bernard Lyon 1 in France have reported progress on integrating mid-infrared (MIR) III-V quantum cascade laser (QCL) diodes on a silicon photonics platform through molecular bonding [Maxime Lepage et al, Optics Express,v33, p37614, 2025].

The researchers comment: "Stable pulsed operation was maintained up to 72°C, with a characteristic temperature T_0 of 180K, comparable to state-of-the-art QCLs on native III-V substrates."

The researchers see opportunities for environmental monitoring, medical diagnostics, and industrial sensing, based on MIR spectroscopy. "A fully integrated MIR silicon photonic chip would enable cost-effective mass production using CMOS-compatible fabrication, paving the way for consumer-grade MIR devices and large-scale onsite sensing applications," they write.

However, in this wavelength range the optical coupling between III-V and silicon is particularly challenging. To improve the coupling performance, the team adopted what they believe to be a novel approach, using high-index-contrast, phase-matched silicon on nitride on insulator (SONOI) substrate for the silicon photonic integration with the QCL through molecular bonding.

"The successful implementation of adiabatic coupling through a phase-matched high-index-contrast platform not only addresses a long-standing limitation in III-V/Si hybrid integration but also sets the stage for the co-integration of additional passive and active MIR components," the researchers report, adding "Continuous-wave operation, the integration of on-chip detectors, and the extension toward dual-comb spectroscopy are promising avenues that could turn this platform into a fully functional MIR lab-on-a-chip."

The researchers designed the integration so that the III-V provided optical gain, while feedback, coupling, and power extraction were provided by the phase-matched, high-index-contrast SONOI photonic integrated circuit (PIC) platform (Figure 1). The optical field was confined in a series of InGaAs/InAlAs multiple-quantum wells (MQWs) in a quantum cascade structure

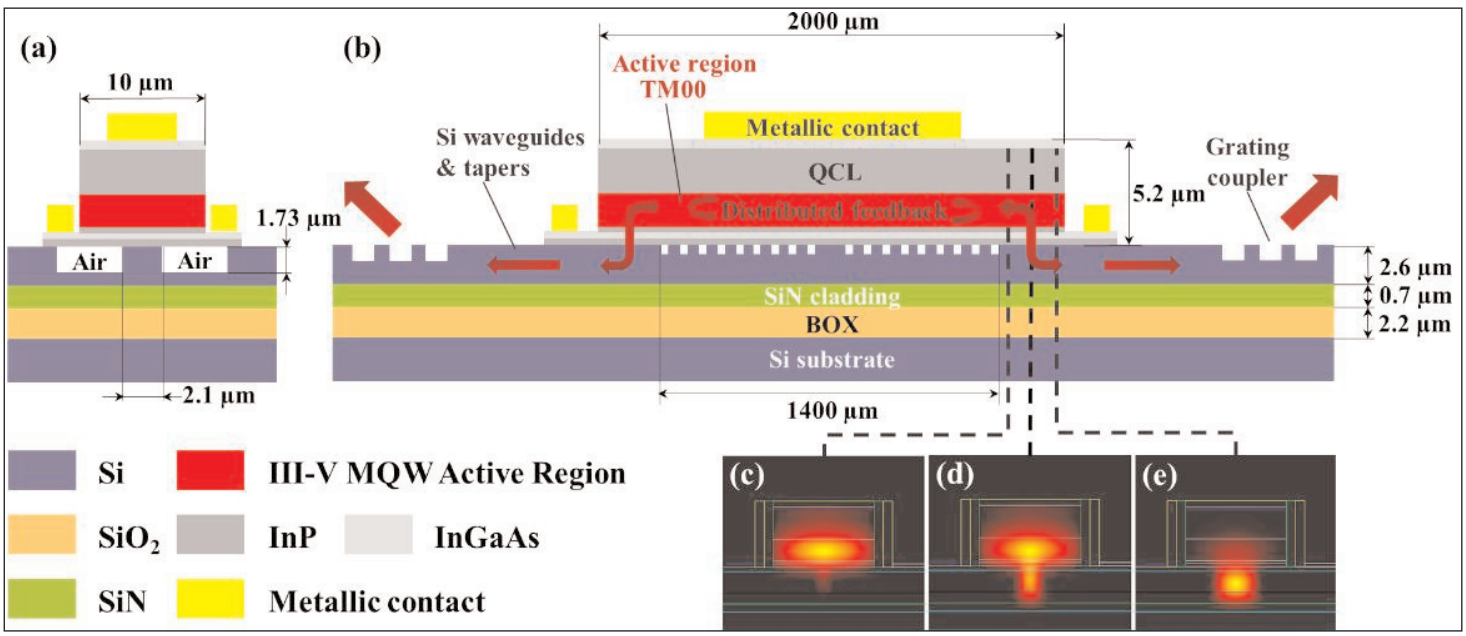


Figure 1. Transversal (a) and longitudinal (b) schematic views of laser. (c–e) Distribution of TM_{00} optical mode along taper transition: (c) taper input, (d) taper midpoint, (e) taper output.

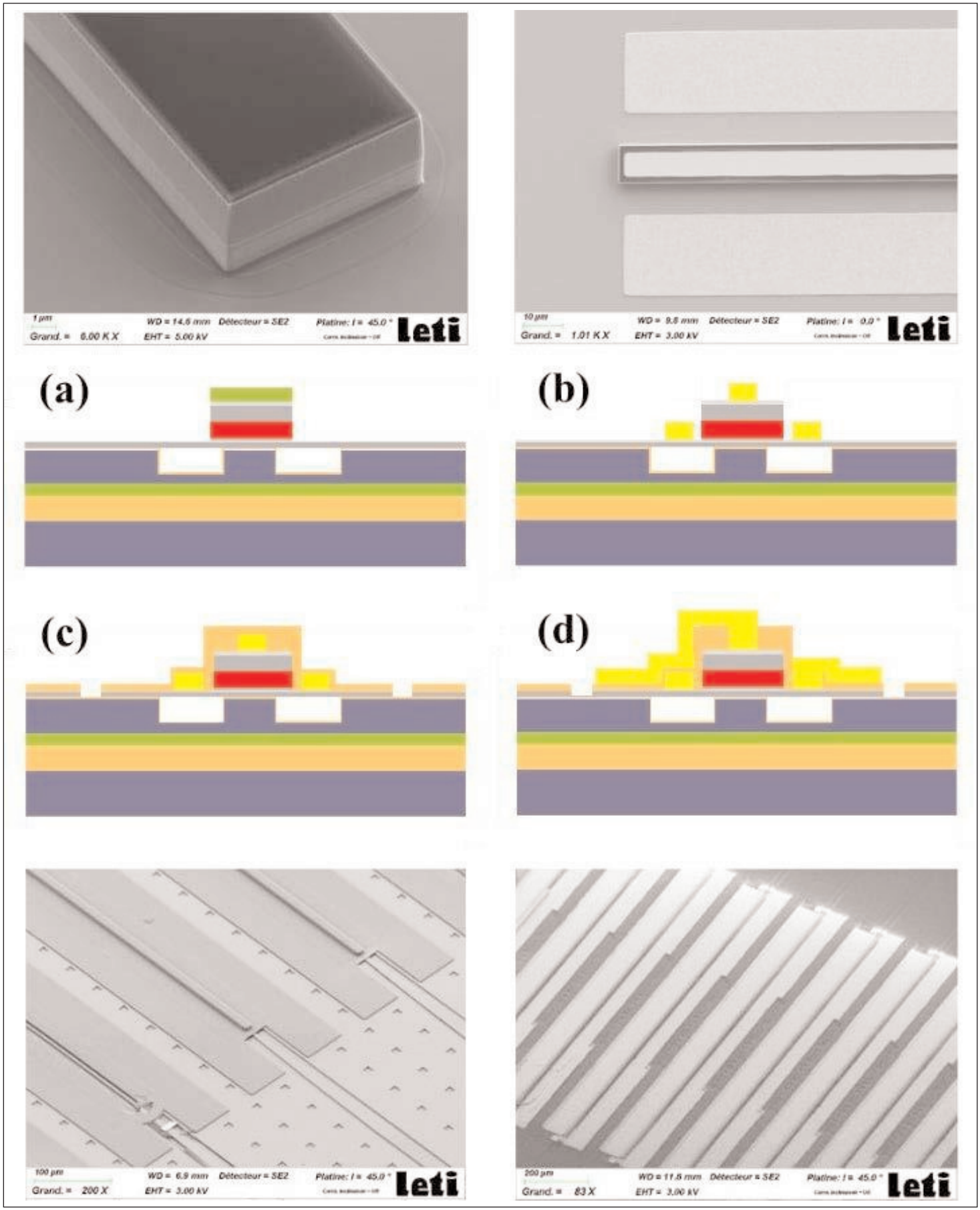


Figure 2. Process flow for III-V patterning and formation of electrical contacts. (a) Dry etching of top InP cladding and active region. (b) Metallic contact deposition and patterning via lift-off. (c) Passivation and etching of bottom III-V layers. (d) Opening of passivation layer followed by deposition and patterning of contact pads.

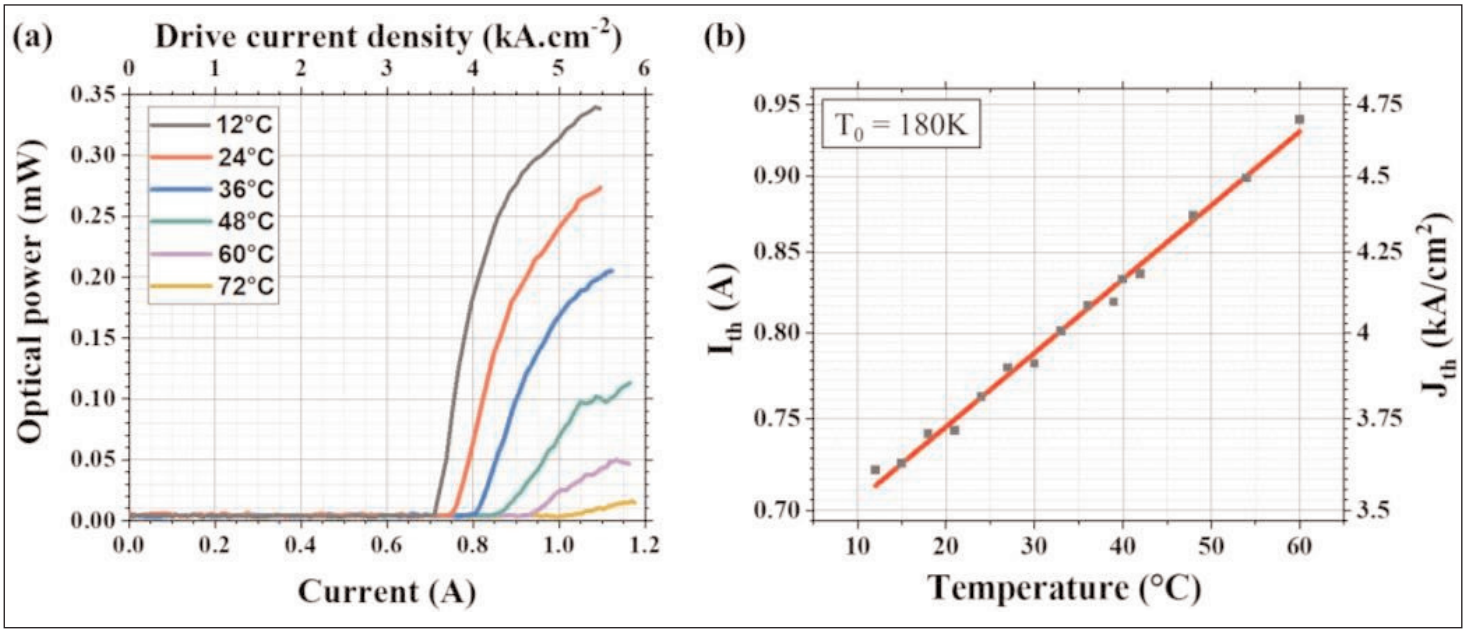


Figure 3. (a) Temperature-dependent optical power, current, and voltage (LIV) characteristics from 12°C to 72°C. (b) Evolution of threshold current with temperature.

with peak gain around 4.31μm wavelength. The target dimensions of the III-V waveguide were 2mmx10μmx5.2μm.

The PIC structures used a 700nm silicon nitride (SiN) cladding layer to isolate the optical field from the buried oxide (BOX) layer. The QCL distributed feedback was provided by a quarter-wave shifted grating etched into the underlying silicon waveguide with 870nm slab and 1.73μm rib heights.

The optical coupling between the III-V gain medium and silicon waveguide PIC had a theoretical coupling efficiency exceeding 95% through tapering from 2.1μm to 4μm width over a 290μm transition region. External power extraction at a 20° angle to the surface normal was through grating couplers leading to an indium fluoride mid-IR optical fiber.

The researchers used finite-element and finite-difference optical simulations to optimize the designed structures.

The SONOI substrate was based on a 200mm-diameter silicon-on-insulator substrate with Si and SiN chemical vapor deposition layers transferred onto an oxidized silicon substrate. Mechanical grinding and selective chemical etch resulted in the final SONOI substrate.

The III-V heterostructure was grown on a 3-inch indium phosphide (InP) substrate. The material was bonded to the SONOI using oxygen plasma activation of the native oxide surfaces of the III-V material and the PIC substrate.

The researchers comment: "This plasma activation increases the density of surface hydroxyl (-OH) groups, enabling the formation of covalent molecular bonds at the interface. Once plasma-activated, both surfaces are brought into contact at room temperature to initiate the bonding. To further consolidate the bonding interface, a 2-hour annealing at 300°C is performed."

The silicon surface of the substrate was meshed with vertical out-gassing channels to prevent voids forming from released gases such as hydrogen and steam during annealing of the molecular bonds between the III-V flipped onto the SONOI substrate.

The laser structure with metal contact was fabricated after removal of the InP substrate and etch stop layers (Figure 2).

The threshold current and voltage of a typical device in 12°C pulsed operation were 3.5kA/cm^2 and 16V, respectively. Single-mode emission up to 4kA/cm^2 was observed at 4.315μm wavelength, consistent with the design parameters. Multi-mode emissions continue until output power rollover at 340μW, around 5.5kA/cm^2. Accounting for fiber propagation losses and grating extraction efficiency, the team estimates a maximum on-chip power of more than 476μW.

The QCL assembly was also operated at different temperatures up to 72°C (Figure 3). The expected exponential evolution of the threshold with temperature showed an extracted characteristic temperature T_0 of 180K, "a value consistent with those reported for low-doped quantum cascade lasers fabricated on native InP substrates and operating under pulsed, low-duty-cycle conditions," according to the team.

The thermal rollover of the QCL was attributed to self-heating, due to high contact resistance at the III–V/metal interface and low conductivity in the thin, moderately doped lower cladding. The buried oxide layer also presents a thermal barrier to vertical heat dissipation, further impacting performance. ■

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Indium arsenide quantum dot laser full MBE on (100) silicon

V-grooves eliminate anti-phase boundaries and reduce threading dislocations.

Researchers based in the UK and France have reported the growth of indium arsenide (InAs) quantum dots (QDs) in gallium arsenide (GaAs) by molecular beam epitaxy (MBE) using a V-grooved silicon (Si) substrate with (100) orientation, as used for mainstream complementary metal-oxide-semiconductor (CMOS) electronics manufacturing [Makhayeni Mtunzi et al, J. Phys. D: Appl. Phys., v58, p405101, 2025]. The team fabricated O-band (1260–1360nm) QD lasers operating up 90°C temperatures.

The team, from University College London, University of Southampton, Swansea University, University of Surrey and the University of Warwick in the UK and University Grenoble Alpes in France, comments: "This work establishes a simplified CMOS-compatible pathway for monolithic integration of III–V QD lasers on silicon, addressing critical challenges in defect suppression. The results serves as a vision for the future of seamlessly integrated electronic–photonic platforms on silicon."

Such platforms are aimed at high-speed optical communication and computing applications, which require increasing integration of optical and CMOS electronics data/signal processing.

Although MOVPE is advantageous for the growth of buffers on silicon, MBE tends to provide better QD performance. Hybrid approaches combining the two methods would seem logical, but this adds complexity, and "may constrain scalability," the team believes: "Achieving all MBE-grown InAs/GaAs QD lasers on CMOS-compatible (001) Si is therefore a critical step toward a cost-effective and practical integration pathway."

The (100) Si orientation is not ideal for III-V growth and usually (111) Si substrates are used. The use of V-grooves enables (111) Si facets to be presented to the III-V growth process: metal-organic vapor phase epitaxy (MOVPE) or molecular beam epitaxy (MBE). The team stresses their use of just MBE: "Unlike previous approaches that combine metal–organic

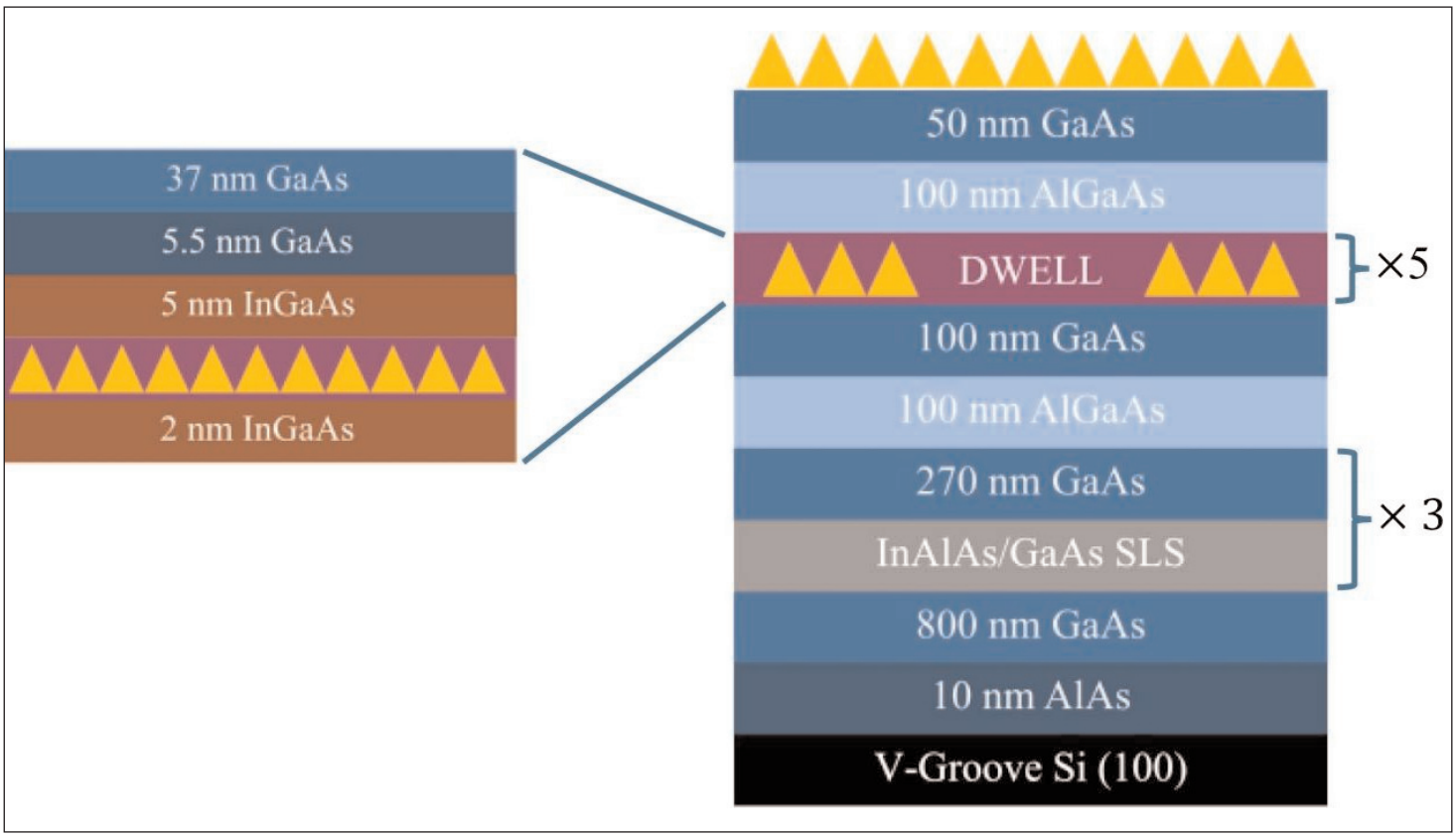

Figure 1. Schematic InAs QD structure featuring three dislocation filter layer (DFL) repeats and five dot-in-well (DWELL) stack. A top uncapped QD layer was used for optimization analysis.

vapor phase epitaxy and MBE processes or employ homoepitaxial silicon regrowth to form (111) facets, our method uses substrates with pre-defined (111) facet exposure, avoiding additional surface engineering."

The (111) V-groove facets aligned to the [110] direction were created in an 8-inch diameter (100) Si substrate by deep-ultraviolet photolithography, inductively coupled plasma etching, photoresist removal, and a series of hydrofluoric acid and tetramethylammonium hydroxide (TMAH) wet etch treatments. The groove width was 350nm, giving a sawtooth profile.

The V-groove material was diced into 2.1cmx2.1cm squares for the MBE growth.

The QD structure aimed at 1.3μm wavelength emission (Figure 1) was grown based on optimized growth parameters for aluminium arsenide (AlAs) nucleation and a GaAs buffer, dislocation filter layer (DFL) strained-layer superlattice (SLS), and dot-in-well (DWELL) structures.

The V-grooves were found to be effective in avoiding anti-phase boundaries (APBs) and in reducing defects. The researchers comment: "The symmetrical geometry of the V-groove promotes effective defect annihilation, as dislocations propagating along opposing Si (111) facets are directed toward the apex of the sawtooth structure. Their convergence at this point increases the likelihood of mutual annihilation, thereby limiting the propagation of defects into the upper epitaxial layers."

The threading dislocation density (TDD) reached as low as $2.91 \times 10^7/cm^2$ at the GaAs buffer surface. An optimized QD structure with $5.88 \times 10^{10}/cm^2$ dot density had a 34.6meV full-width at half maximum (FWHM) photoluminescence peak.

For the laser diodes, the team added an extra DFL along with contact and cladding layers: 300nm n-GaAs contact, 1400nm n- and p-type $Al_{0.4}Ga_{0.6}As$ cladding around the DWELL active layers, and 400nm p-GaAs top contact.

This material was fabricated into 25μm-wide broad-area InAs/GaAs QD Fabry–Pérot laser diodes. The p-electrode was sputtered titanium/gold, and the n-type metal stack was evaporated nickel/gold-germanium/nickel/gold. The wafer was annealed and thinned to 180nm before cleaving into 2mm-long laser bars.

The room temperature (RT) performance characteristics gave 88.7mA threshold current ($177.4A/cm^2$). The laser continued operating up to 90°C (Figure 2). The temperature variation of the threshold had a T_0 characteristic of 28.4K. The variation in slope efficiency, T_1, was 48.5K. ■

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Author: Mike Cooke

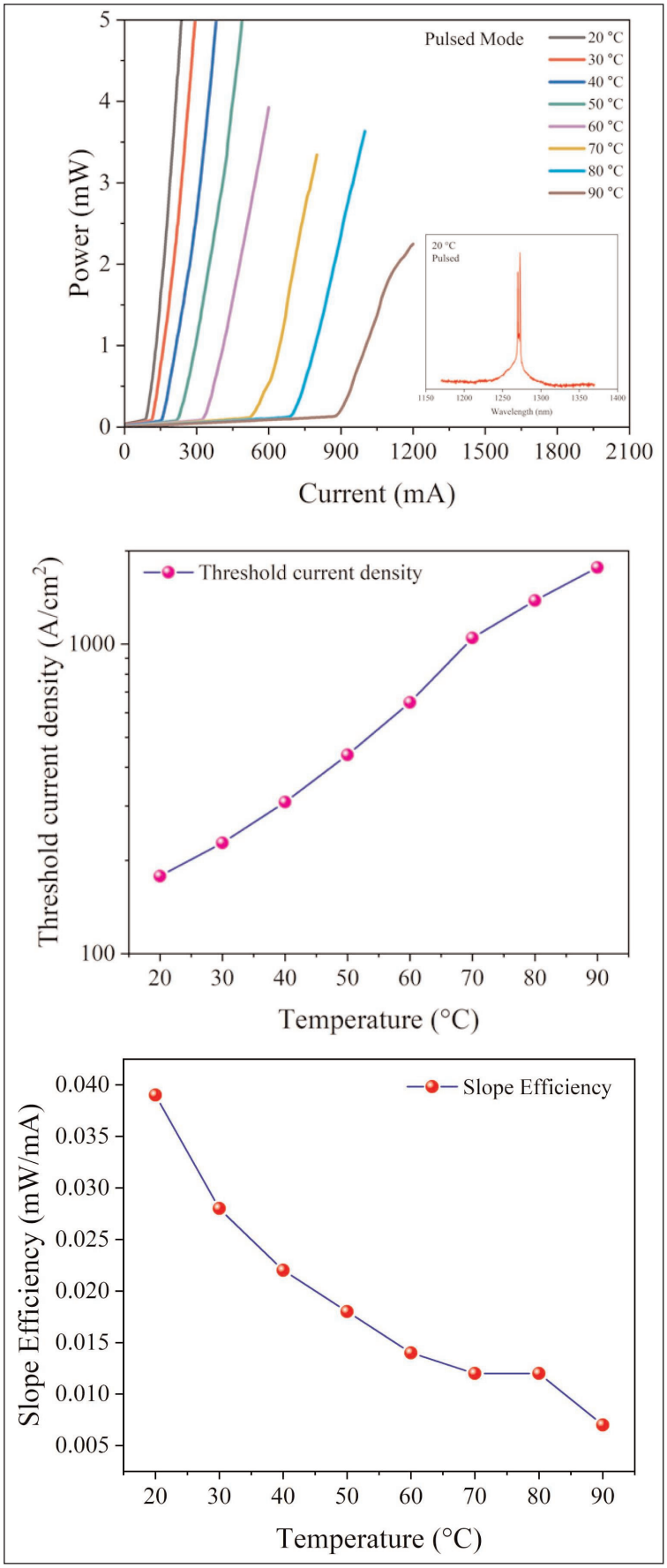

Figure 2. (a) Light–current (L–I) characteristics of QD laser under pulsed-mode injection, measured from 20°C to 90°C. Inset: emission spectra at room temperature (RT). (b) Threshold current density as a function of temperature. (c) Slope efficiency variation.

MOCVD–MBE hybrid growth for green laser diodes

The lower growth temperature enabled by the use of MBE eases thermal budget constraints.

Researchers in China propose the use of hybrid growth methods for longer-wavelength indium gallium nitride (InGaN) laser diodes (LDs) [Jun Fang et al, Appl. Phys. Lett., v127, p072105 2025].

The main methods for growing high-quality III–nitride crystal device layers such as InGaN are metal-organic chemical vapor deposition (MOCVD) and molecular beam epitaxy (MBE). While MOCVD is favored in terms of growth speed, the slower MBE method is usually carried out at lower temperature.

High-temperature growth can degrade previous layers. This is particularly critical for the high-indium-content InGaN needed in the multiple quantum well (MQW) structures of longer-wavelength-emitting laser diodes. Indium is much more volatile than the other metals in the III–nitride family, such as gallium and aluminium (Al). Indeed, due to this volatility, InGaN MOCVD is usually carried out around 700°C to avoid degradation.

But, in subsequent AlGaN cladding layers, MOCVD temperatures are raised to 950–1050°C to achieve the quality needed for optical confinement, gobbling up the thermal processing budget.

MBE processing can achieve decent AlGaN quality with lower temperatures of order 700–750°C, easing the budget constraints.

The research team from University of Science and Technology of China, Suzhou Institute of Nano-Tech and Nano-Bionics, and Suzhou Laboratory in China comments: "The growth of p-type (Al)GaN under low-temperature conditions using MBE is expected to further extend the wavelength range of GaN-based lasers."

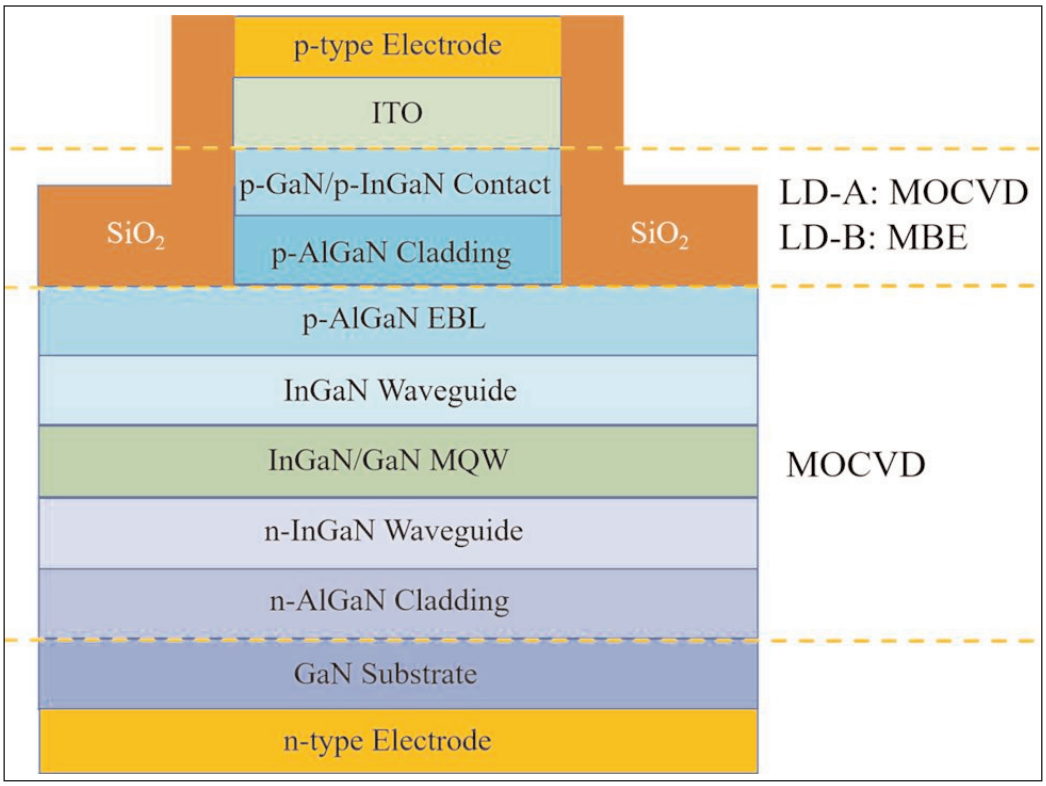

Figure 1. Schematic structure of GaN-based green laser diode. Sample LD-A was grown entirely by MOCVD, while sample LD-B was epitaxially deposited using the hybrid MOCVD–MBE growth approach.

The lower layers of the laser diodes were grown by MOCVD on GaN substrates (Figure 1). For the 'A' laser diodes, the MOCVD continued, while for 'B' the epitaxy was switched to the lower-temperature MBE method, for the upper cladding and contact layers. The upper-cladding MOCVD temperature was around 900°C; the use of MBE allowed the growth temperature to be reduced to 700°C.

These epitaxial materials were fabricated into ridge laser diodes with 200nm inductively coupled plasma CVD silicon dioxide (SiO_2) insulation, 200nm electron-beam-evaporated indium tin oxide (ITO) contact layer and palladium/platinum/gold p-electrode. The n-electrode on the backside of the device was titanium/aluminium/titanium/gold. The emission/mirror facets were cleaved with optical dielectric coatings applied to improve performance.

Large samples of devices from various locations on the source wafers were characterized in terms of threshold

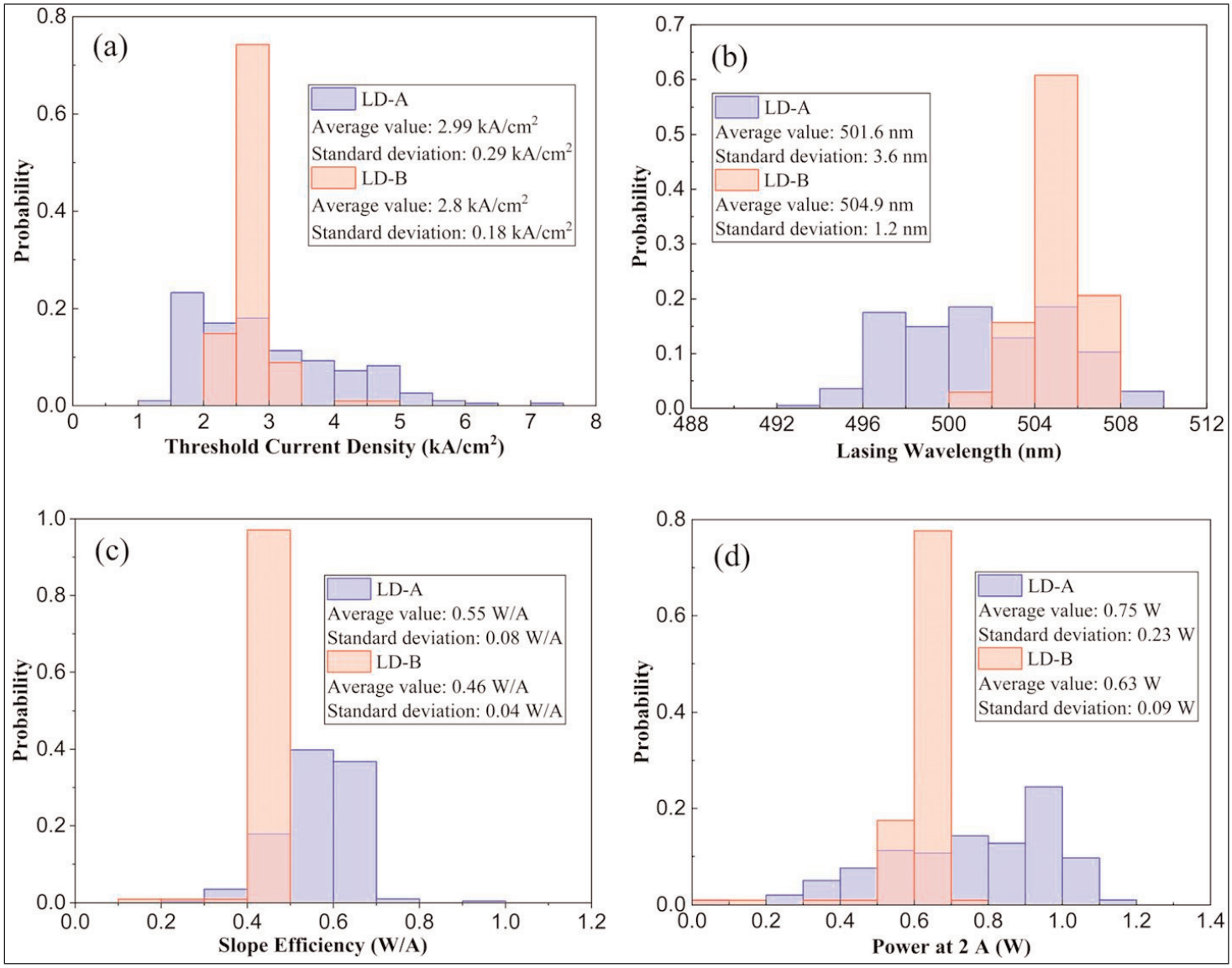

Figure 2. Histograms of (a) threshold current density, (b) lasing wavelength, (c) slope efficiency, and (d) output power at 2A current for LD-A and LD-B chips.

current density, laser wavelength, slope efficiency and output power (Figure 2). The spread in numbers, as indicated by the standard deviation, was significantly smaller in the LD-B sampling for all parameters.

The researchers comment: "In terms of the best-performing individual chips, LD-A exhibits a lower threshold current density. However, the average threshold current density of LD-A is substantially higher based on the overall statistical results. This observation may be attributed to two underlying physical mechanisms: (1) increased non-radiative recombination centers — LD-A's QWs have suffered more severe thermal degradation, leading to a greater density of non-radiative centers, which reduce carrier radiative recombination efficiency and consequently increase the threshold current density; (2) increased optical loss — the thermal degradation can roughen quantum well interfaces and increase the defect density, thereby increasing the internal optical loss. Greater optical loss results in higher threshold current density."

The lasing wavelength of the LD-A devices was generally shorter wavelength, attributed to variable thermal degradation of the InGaN multiple quantum wells during the high-temperature MOCVD. Degradation effects include phase separation of regions of lower and higher indium content, along with reduced indium content overall. Lower-indium-content InGaN has a wider bandgap energy, resulting in higher-energy, shorter-wavelength photons.

The lower average slope efficiency of LD-B is attributed to the higher magnesium doping of the upper cladding layers. High Mg-doping has been found to result in high optical absorption, significantly reducing slope efficiency in green InGaN laser diodes. The optical absorption has to be balanced by the need to reduce series resistance, the purpose of doping after all, between the external bias and the MQW region. ■

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Author: Mike Cooke

Electrochemical III-nitride device lift-off

Plotting a route for the scalable, damage-free integration of III-nitrides onto diverse platforms for optoelectronic applications.

University of California Santa Barbara (UCSB) reports on the use of electrochemical etching as a lift-off method for the transfer of thin films of III-nitride materials to optoelectronic platforms [Yifan Yao et al, Appl. Phys. Lett., v127, p101102, 2025]. The team comments: "This method provides a scalable, damage-free route for integrating high-quality III-nitride onto diverse platforms for advanced III-nitride opto-electronic applications."

The researchers see the method as being applicable to device transfer to flexible substrates, photonic platforms, and other advanced optoelectronic and electronic systems.

The team reports: "The epitaxial layers remained intact during the lift-off process with a smooth surface and preserved crystal quality. Vertical thin-film micro-light-emitting-diodes (μLEDs) were lifted off from the growth substrate and exhibited bright electroluminescence, showing great potential for enabling scalable mass transfer of μLEDs and heterogeneous integration of III-nitride materials for advanced optoelectronic applications."

The team contrasts the electrochemical technique with more established laser lift-off (LLO): "While LLO has been applied extensively in some LED manufacturing processes, it can often induce defects due to significant strain and heat generated during the decomposition process. These detrimental effects can be more pronounced for longer-wavelength InGaN devices with higher indium composition."

The device source for material and structural analysis was a metal-organic chemical vapor deposition epitaxial structure grown on sapphire (Al_2O_3) substrate (Figure 1). The material included a 50nm sacrificial layer below the device layers for the electrochemical etching. This layer was heavily doped with silicon (Si) at a concentration of $1x10^{20}/cm^3$. The sacrificial concentration was designed to have a high contrast with the other device layers with less that $3x10^{18}/cm^3$ silicon.

To prepare for the electrochemical etching, trenches

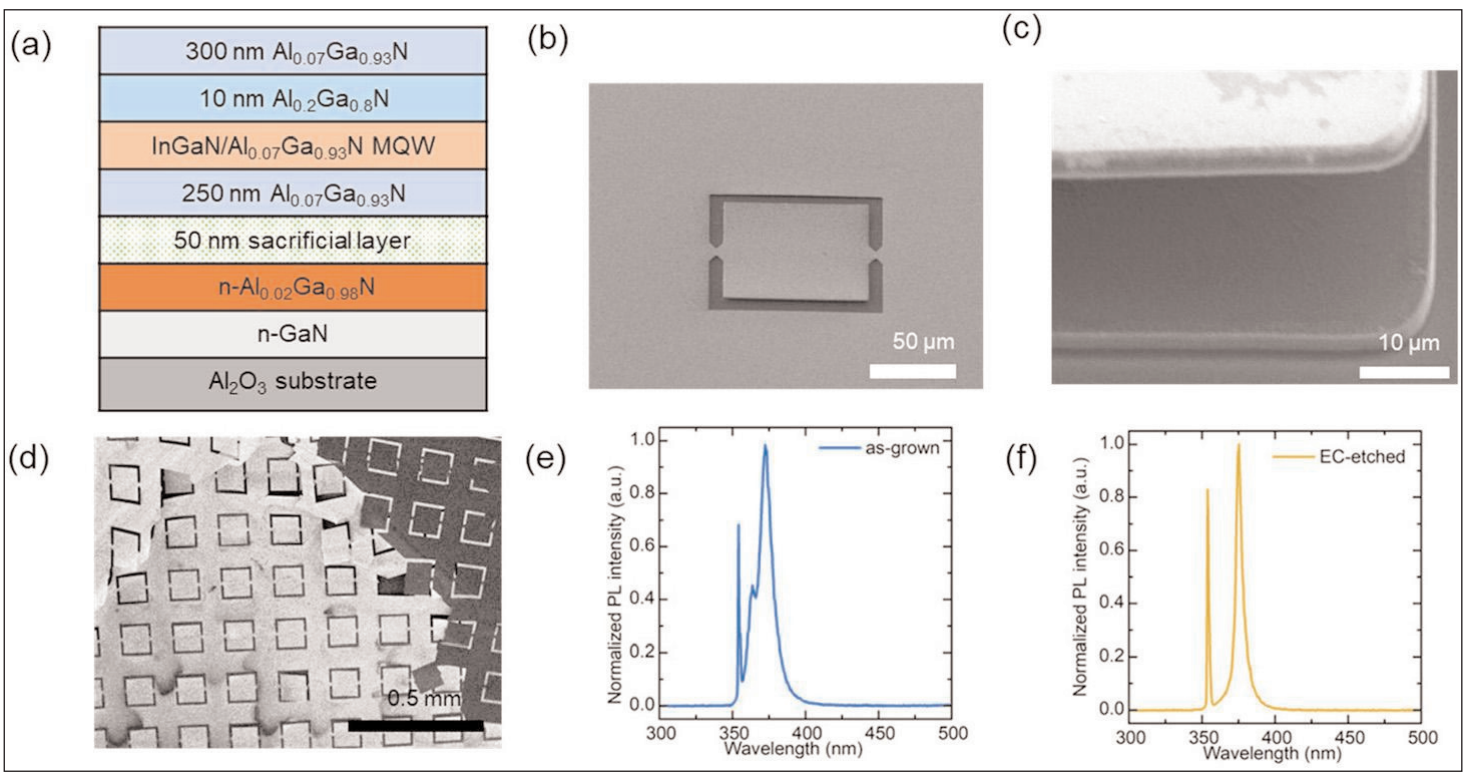

Figure 1. (a) Epitaxial structure of III-nitride device layers with 50nm sacrificial layer before electrochemical etch; (b)–(d) scanning electron microscopy (SEM) images of III-nitride film after etch. PL spectra of structure measured with 355nm laser excitation: (e) before and (f) after etching.

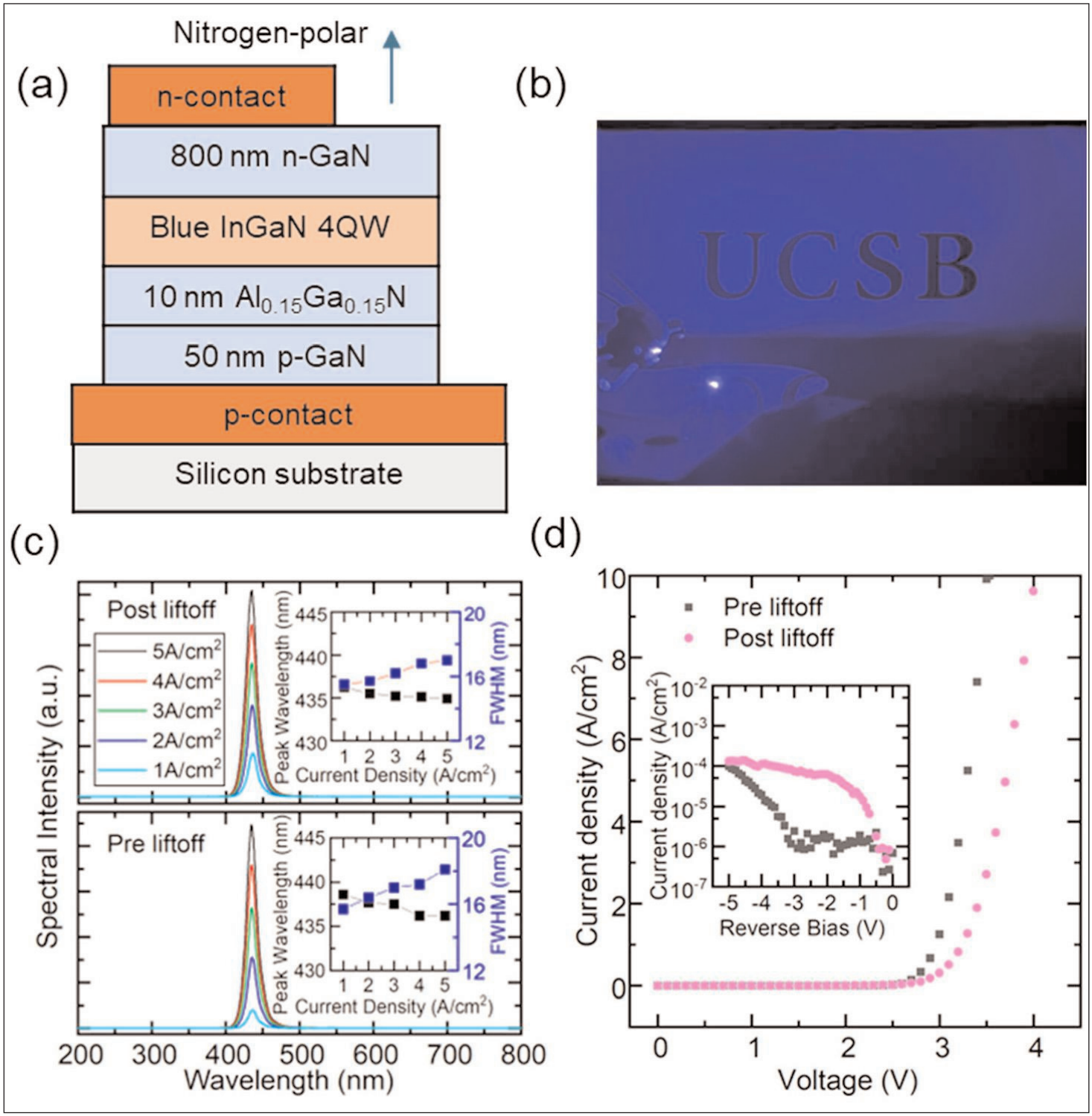

Figure 2. (a) Structure of InGaN-based blue LEDs transferred to silicon. (b) Image of single 100μmx100μm blue LED with 1mA injection current. (c) Electroluminescence (EL) spectra at different current densities before and after lift-off; inset: peak wavelength and FWHM changes. (d) The current density–voltage (J–V) behavior of single blue LED before and after lift-off under forward bias; inset: leakage current under reverse bias before and after lift-off.

were cut into the overlying device layers to expose the sacrificial layer. The trench patterns included two thin tethers to anchor the platelets. The trenches were formed via reactive ion etch.

The electrochemical etch used the sample as the anode with an indium connection to the voltage bias, while the cathode consisted of platinum wire. The electrolyte was 68% nitric acid, which enabled a redox reaction to take place with an applied voltage, cutting into the sacrificial layer. Once the etch process stabilized, the lateral etch speed was around 10–20μm/minute.

The researchers report: "The thickness of the film is approximately 600nm, significantly thinner than typical GaN thin films obtained by laser lift-off."

The surface roughness of the etched surface from atomic force microscopy (AFM) scans over a 2μmx2μm area was 0.5nm. The team comments: "The roughness is orders of magnitude lower than that of typically reported III-nitride films using the electrochemical etching process with lower silicon doping or using other types of etching."

The platelets could be transferred to carrier substrates either using polymer stamps or adhesive tape. The tethers broke easily during the transfer step, giving a clean separation of devices from the surrounding material.

The active region of the device material contained two InGaN quantum wells (QW) separated by AlGaN barriers. Photoluminescence (PL) with 355nm laser excitation showed two peaks: a narrow 355nm line from the pump, and a wider 11nm full-width at half maximum (FWHM) peak at ~374nm wavelength from the multiple QWs. In PL spectra from the as-grown samples, there was also a small peak at 364nm attributed to the underlying GaN template. The wider bandgaps of the AlGaN layers were outside the range of the laser excitation.

For the lifted device layers, the MQW peak shifts to 276nm, and narrows to 5.9nm FWHM. The shift and narrowing could be due to strain relaxation in the released device layers, "but still falls within the expected wafer-scale emission non-uniformity," according to the team. The narrower peak "is likely due to the micro-cavity effect, resulting from the mirror-like, smooth AlGaN surface produced by the electrochemical etching process."

The researchers comment: "The absence of a GaN-related PL peak indicates the film is completely detached from the substrate, while the strong and preserved MQW emission indicates the InGaN quantum wells are still intact throughout the electrochemical etching process."

The electrochemical lift-off technique was applied to blue InGaN LED structures transferred to a silicon substrate (Figure 2). The bonding between the silicon and flipped p-GaN contact was through palladium/gold, acting as a p-electrode.

The electrical performance of the device after lift-off and transfer showed some degradation with higher series resistance and current leakage under reverse bias. The researchers mainly attribute the higher series resistance to an "unoptimized metal electrode (which is a soldered indium dot) on the bonded surface." The increased leakage current at lower bias is, they write, "likely due to increased surface leakage from the exposed sidewalls created during the lift-off process."

The researchers hope that future optimizations of surfaces and interfaces will tackle these issues. ■

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Boron nitride as a buffer and gate dielectric

Ultrawide-bandgap hexagonal boron nitride has been used to demonstrate AlGaN HEMTs with an ultra-high ~10^{11} on/off current ratio.

Xidian University in China has reported the use of ultrawide-bandgap hexagonal boron nitride (hBN) to improve the performance of aluminium gallium nitride (AlGaN) high-electron-mobility transistors (HEMTs) [Haoran Zhang et al, IEEE Electron Device Letters, vol.46, issue 10 (October 2025), p1693]. The BN was used both as a buffer for van der Waals epitaxy, and as part of the gate stack. These features enabled an extremely high ~10^{11} on/off current ratio, along with a high maximum saturated output current density of 1550mA/mm.

Boron nitride is a two-dimensional (2D) material consisting of hexagonal layers, like graphene, held together by weak van der Waals interlayer bonds. The Xidian team comments: "Recent GaN synthesis using a 2D material technology has attracted considerable research interest. The weak bonding between 2D materials and GaN effectively reduces stress caused by lattice mismatches during heteroepitaxy, thereby greatly decreasing the dislocation density and improv-

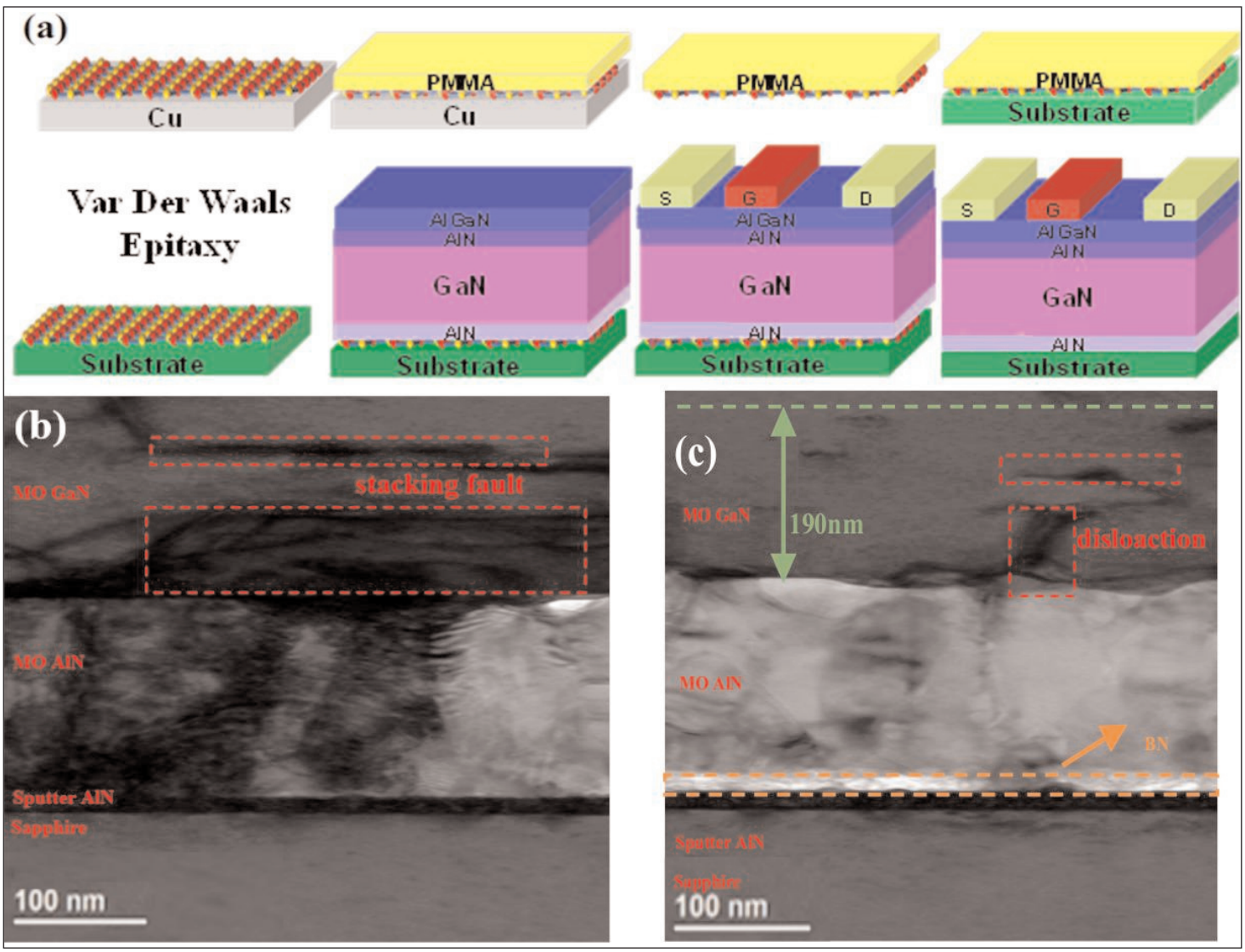

Figure 1. (a) Van der Waals epitaxy process and cross-sectional schematics of AlGaN/GaN HEMTs. (b) Interface scanning transmission electron microscope (STEM) cross section of bottom layer of sample without BN buffer. (c) Same but with BN buffer.

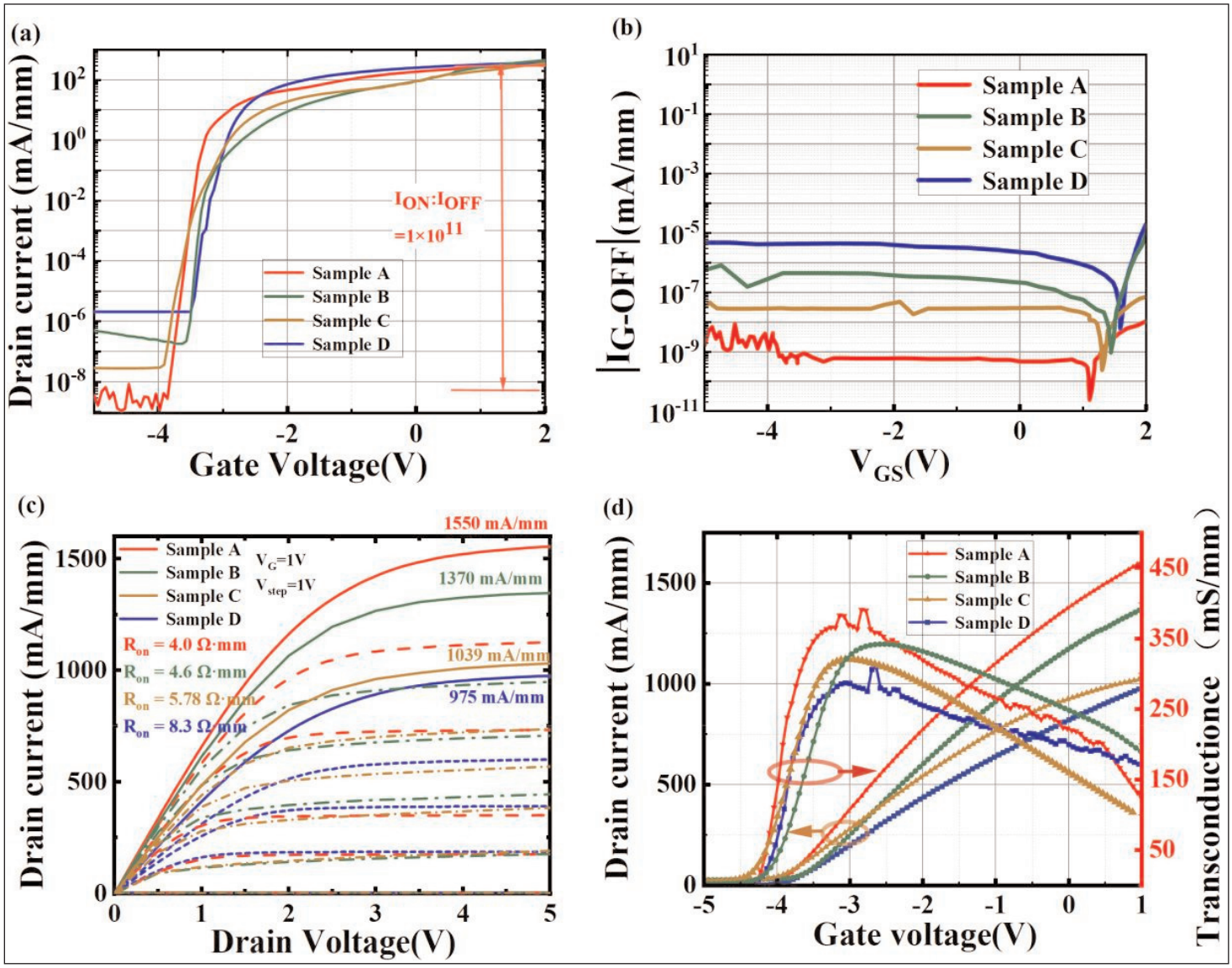

Figure 2. (a) Device-transfer semi-logarithmic curves. (b) Device leakage curve. (c) Output current–voltage characteristics. (d) Transfer characteristics.

ing the material quality."

The researchers see potential for application in high-power electronic systems.

The epitaxial material for the HEMTs was produced on sapphire with and without a BN buffer layer (Figure 1). The BN was grown on copper (Cu) foil via chemical vapor deposition (CVD) and transferred by transparent poly(methyl methacrylate) (PMMA) thermoplastic onto the sapphire substrate covered with 30nm sputtered AlN layer.

The researchers report: "The inclusion of the hBN buffer significantly enhances device performance. Compared to the samples without hBN buffer, the introduction of the hBN buffer layer increases the 2DEG sheet density from $5.8x10^{13}/cm^2$ to $1.24x10^{13}/cm^2$, enhances the electron mobility from $1726cm^2/V\text{-}s$ to $2091cm^2/V\text{-}s$, and reduces the sheet resistance (R_{sh}) from 430Ω/❑ to 290Ω/❑."

The team attributes these improvements to the transport properties of the 2D electron gas (2DEG) channel to "dislocation filtering and crystal quality enhancement" from using the BN buffer layer. The rest of the device material consisted of 200nm AlN, 1.2µm GaN buffer, 300nm undoped GaN, and 25nm $Al_{0.25}Ga_{0.75}N$ barrier, applied using metal-organic CVD.

A low-cost 8nm sputtered BN layer was added as a gate dielectric, after removing the GaN cap layer used to protect the AlGaN barrier from contamination such as oxidation. This dielectric thickness was chosen on the basis of simulations suggesting that the on/off current ratio would have a maximum at 7nm. The choice of 8nm took account of the deposition method and the minimal deterioration of the on/off ratio beyond 7nm in the simulations. The magnetron sputtering source was BN. The samples were annealed beforehand.

Four types of HEMT were fabricated exhausting the possible combinations with and without BN used for the buffer and gate dielectric. The gate length and gate–source/–drain spacings were 150nm and 850nm/1µm, respectively. The gate width was 50µm.

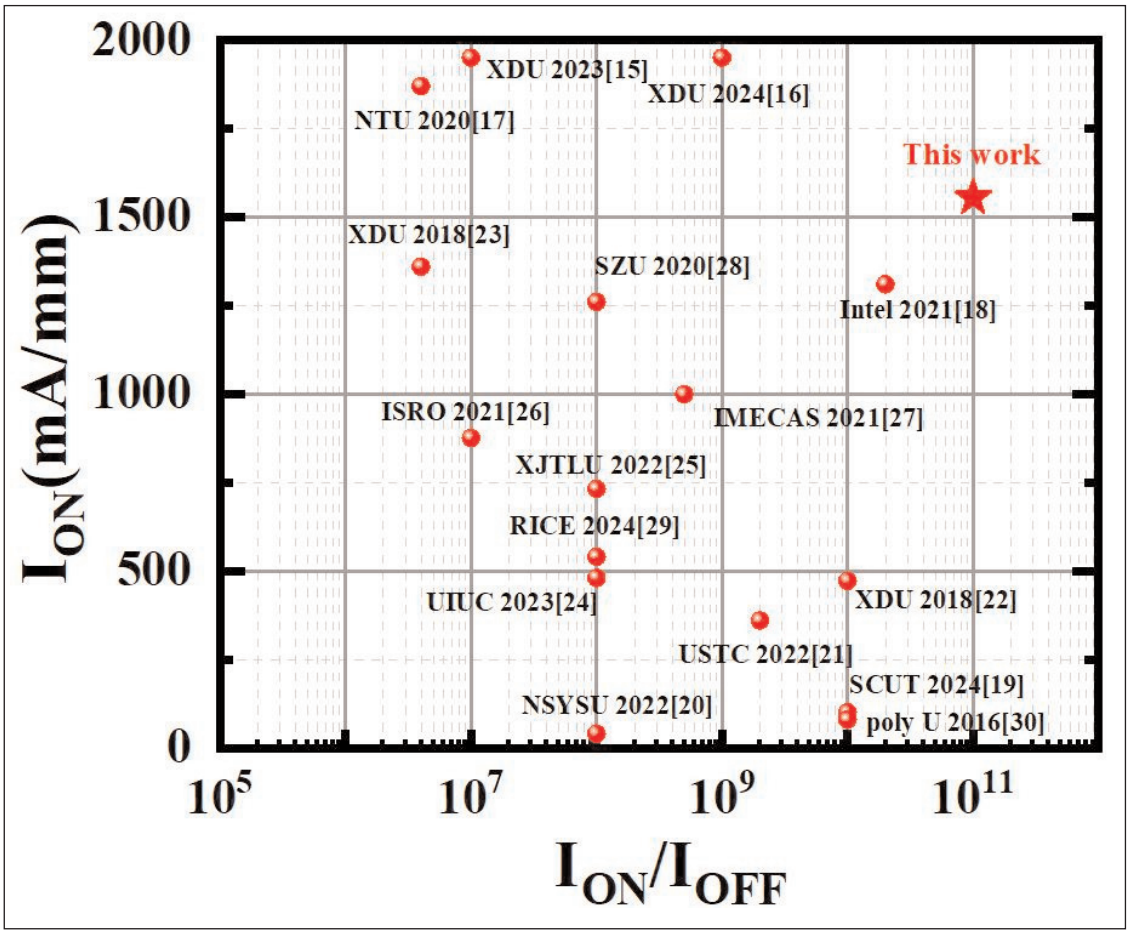

Figure 3. Benchmarking maximum saturated output current density and on/off current (I) ratio.

The HEMT with both BN buffer and dielectric (sample A) outperformed the other variations (Figure 2). In particular, the on/off ratio was around 1011, some three orders of magnitude better than sample D with no BN at all. The other variations, B and C, had BN only as the buffer and dielectric, respectively.

The devices with BN dielectric exhibited a more negative threshold (around −0.5V), attributed to "positive fixed charges at the BN dielectric/AlGaN interface, resulting in a downward shift of the flat-band voltage (V_{FB}) and a more negative threshold voltage (V_{th})." Since all the devices are 'normally-on' at 0V gate potential, this is undesired behavior in many power applications, where normally-off (enhancement mode) devices offer benefits in terms of lower power consumption, fail safety, and so on.

The maximum saturated output current densities for HEMTs A–D were 1550mA/mm, 1370mA/mm, 1039mA/mm and 975mA/mm, respectively.

The researchers comment: "The increase in the maximum saturated output current density may be related to the improved crystal quality, lower dislocation density, and enhanced 2DEG achieved by the introduction of the h-BN buffer. Additionally, the introduction of the BN gate dielectric further improves the interface quality, reduces the surface state density (D_{it}), and minimizes interface charge, thereby enhancing the gate's control over the channel carriers, improving carrier transport, and ultimately improving the conductivity of the device."

Recent GaN synthesis using a 2D material technology has attracted considerable research interest. The weak bonding between 2D materials and GaN effectively reduces stress caused by lattice mismatches during heteroepitaxy, thereby greatly decreasing the dislocation density and improving the material quality.

The researchers see potential for application in high-power electronic systems

The peak transconductance of HEMT-A was 30% higher than that of D: 360mS/mm compared with 251mS/mm at 5V drain bias. The more significant contributor to improved transconductance was the BN buffer, giving improved conductivity in the channel.

In pulse-mode operation, HEMT-A demonstrated a current collapse of 6%. "The BN/AlGaN interface effectively suppresses trap-assisted carrier scattering and mitigates dynamic degradation by reducing trap occupancy modulation during switching," the team comments. Current collapse in conventional GaN HEMTs can be of order 30%.

Comparing the Xidian work with other reports shows the highest on/off ratio combined with a good maximum saturated output current density (Figure 3). ■

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Fax: +49 2407 9030 40
www.aixtron.com

ETC (LPE subsidiary)
Via Falzarego, 820021 Baranzate (Mi),
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Tel: +39 02 383 41 51
Fax: +39 02 383 06 118
www.lpe-epi.com

Evatec AG
Hauptstrasse 1a,
CH-9477 Trübbach,
Switzerland
Tel: +41 81 403 8000
Fax: +41 81 403 8001
www.evatecnet.com

FHR Anlagenbau Gmbh
(Vital Materials subsidiary)
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www.plansee.com

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Tel: +1 727 577 4999
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www.svta.com

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Fax: +1 925 449-4096
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Veeco Instruments Inc
100 Sunnyside Blvd.,
Woodbury, NY 11797,
USA
Tel: +1 516 677 0200
Fax: +1 516 714 1231
www.veeco.com

7 Wafer processing materials

Kayaku Advanced Materials Inc
200 Flanders Road,
Westborough, MA 01581,
USA
Tel: +1 617 965 5511
www.kayakuam.com

Praxair Electronics
(see section 5 for full contact details)

Versum Materials
8555 S. River Parkway,
Tempe, AZ 85284,
USA
Tel: +1 602 282 1000
www.versummaterials.com

8 Wafer processing equipment

Evatec AG
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CH-9477 Trübbach,
Switzerland
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EV Group
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Fax: +44 (0) 1389 879 042
www.logitech.uk.com

Plasma-Therm LLC
(see section 6 for full contact details)

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Fax: +1 408 734 0961
www.samcointl.com

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Fax: +44 (0)1633 414141
www.spts.com

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Fax: +49 89 32007 162
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Switzerland
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Fax +41 21 694 35 01
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2700 Augustine Drive, Suite 110,
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USA
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Fax: +1-408-748-0111
Contact Person: Cathy W. Hung
Email: sales@tecdia.com
www.tecdia.com

Veeco Instruments Inc
(see section 6 for full contact details)

9 Materials & metals

Goodfellow Cambridge Ltd
Ermine Business Park, Huntingdon,
Cambridgeshire PE29 6WR, UK
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Fax: +44 (0) 1480 424900
www.goodfellow.com

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Austria
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Fax: +1 408 748 0111
www.tecdia.com

10 Gas and liquid handling equipment

Cambridge Fluid Systems
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Fax: +44 (0)1954 786818
www.cambridge-fluid.com

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Fax: +44 (0)1278 420666
www.iemtec.com

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11 Process monitoring and control

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Tel: +1 800 223 2389
Tel: +1 716 684 4500
www.conaxtechnologies.com

k-Space Associates Inc
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Tel: +1 734 426 7977
Fax: +1 734 426 7955
www.k-space.com

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Fax: +1 408 875 4144
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Bregstrasse 90,
D-78120 Furtwangen im Schwarzwald,
Germany
Tel: +49 7723 9197 0
Fax: +49 7723 9197 22
www.wepcontrol.com

12 Inspection equipment

Bruker
Oestliche Rheinbrueckenstrasse 49,
Karlsruhe, 76187, Germany
Tel: +49 (0)721 595 2888
Fax: +49 (0)721 595 4587
www.bruker.com

KLA–Tencor
160 Rio Robles, Suite 103D,
San Jose, CA 94538-7306,
USA
Tel: +1 408 875-3000
Fax: +1 510 456-2498
www.kla-tencor.com

13 Characterization equipment

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Fax: +1 402 477 8214
www.jawoollam.com

Lake Shore Cryotronics Inc
575 McCorkle Boulevard,
Westerville, OH 43082, USA
Tel: +1 614 891 2244
Fax: +1 614 818 1600
www.lakeshore.com

14 Chip test equipment

Riff Company Inc
1484 Highland Avenue, Cheshire,
CT 06410, USA
Tel: +1 203-272-4899
Fax: +1 203-250-7389
www.riff-co.com

Tektronix Inc
14150 SW Karl Braun Drive,
P.O.Box 500, OR 97077, USA
www.tek.com

15 Assembly/packaging materials

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4926 Spicewood Springs Road,
Austin, TX 78759, USA
Tel: +1 512 231 8083
Fax: +1 512 231 8183
www.epak.com

Gel-Pak
31398 Huntwood Avenue,
Hayward, CA 94544, USA
Tel: +1 510 576 2220
Fax: +1 510 576 2282
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Wafer World Inc
(see section 3 for full contact details)

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Fax: +1 716 833 2926
www.williams-adv.com

16 Assembly/packaging equipment

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www.cstglobal.uk

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Fax: +1 215 784 6001
www.kns.com

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Fax: +1 508-832-0506
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www.pi-usa.us

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Santa Clara, CA 95054,
USA
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Fax: +1 408 748 0111
www.tecdia.com

17 Assembly/packaging foundry

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San Diego, CA 92127, USA
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Fax: +1 8586 74 4681
www.quikicpak.com

18 Chip foundry

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UK
Tel: +44 (0) 1698 722072
www.cstglobal.uk

United Monolithic Semiconductors
Route departementale 128,
BP46, Orsay, 91401,
France
Tel: +33 1 69 33 04 72
Fax: +33 169 33 02 92
www.ums-gaas.com

19 Facility equipment

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3838 Western Way NE,
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Tel: +1 541 917 3626
www.rena-na.com

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20 Facility consumables

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Fax: +1 410 506 8749
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21 Computer hardware & software

Crosslight Software Inc
121-3989 Henning Dr.,
Burnaby, BC, V5C 6P8,
Canada
Tel: +1 604 320 1704
Fax: +1 604 320 1734
www.crosslight.com

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10404 Patterson Ave.,
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22 Used equipment

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24 Resources

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www.semi.org

Yole Développement
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France
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www.yole.fr

event calendar

If you would like your event listed in *Semiconductor Today*'s Event Calendar, then please e-mail all details to the Editor at mark@semiconductor-today.com

10–12 November 2025
12th IEEE Workshop on Wide Bandgap Power Devices & Applications (WiPDA 2025)
Fayetteville, AR, USA
E-mail: admin@wipda-europe.org
https://wipda.org/

18–21 November 2025
SEMICON Europa 2025
Messe München, Munich, Germany
E-mail: semiconeuropa@semi.org
www.semiconeuropa.org

30 November – 5 December 2025
2025 Materials Research Society (MRS) Fall Meeting & Exhibit
Hynes Convention Center, Boston, MA, USA
E-mail: info@mrs.org
www.mrs.org/meetings-events/fall-meetingsexhibits/2024-mrs-fall-meeting

6–10 December 2025
71st annual IEEE International Electron Devices Meeting (IEDM 2025)
Hilton San Francisco Union Square Hotel, San Francisco, CA, USA
E-mail: iedm-info@ieee.org
www.ieee-iedm.org

17–19 December 2025
SEMICON Japan 2025
Tokyo Big Sight, Tokyo, Japan
E-mail: semicon2025@operation-desk.jp
www.semiconjapan.org

4–6 February 2026
Asia Photonics Expo (APE 2026)
Level 1, Sands Expo & Convention Centre (Marina Bay Sands), Singapore
E-mail: visitors-ape@informa.com
www.asiaphotonicsexpo.com

11–13 February 2026
SEMICON Korea 2026
Korea World Trade Tower, Seoul, South Korea
E-mail: semiconkorea@semi.org
www.semiconkorea.org/en

15–19 February 2026
2026 IEEE International Solid- State Circuits Conference (ISSCC 2026)
San Francisco, CA USA
E-mail: Issccinfo@yesevents.com
www.isscc.org

15–19 March 2026
OFC 2026 (Optical Fiber Communication Conference and Exhibition)
Los Angeles Convention Center, Los Angeles, CA, USA
E-mail: custserv@optica.org
www.ofcconference.org

22–26 March 2026
IEEE Applied Power Electronics Conference and Exposition (APEC 2026)
Henry B Gonzalez Convention Center, San Antonio, TX, USA
E-mail: apec@apec-conf.org
www.apec-conf.org

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28–30 April 2026
29th annual Components for Military & Space Electronics conference & exhibition (CMSE 2026)
Renaissance Los Angeles Airport Hotel, CA, USA
E-mail: info@tjgreenllc.com
www.tjgreenllc.com/cmse

3–8 May 2026
SID Display Week 2026
Los Angeles, CA, USA
E-mail: registration@sid.org
www.displayweek.org

17–21 May 2026
2026 Conference on Lasers & Electro-Optics (CLEO)
Charlotte, NC, USA
E-mail: info@cleoconference.org
www.cleoconference.org

26–29 May 2026
IEEE 76th Electronic Components and Technology Conference (ECTC 2026)
Orlando, FL, USA
E-mail: borabal@ieee.org
www.ectc.net

31 May–4 June 2026
International Power Electronics Conference (IPEC-Nagasaki 2026- ECCE Asia)
Dejima Messe Nagasaki, Nagasaki, Japan
E-mail: ipec2026@or.knt.co.jp
www.ipec2026.org

7–12 June 2026
2026 IEEE/MTT-S International Microwave Symposium (IMS 2026)
Boston, MA, USA
E-mail: exhibits@horizonhouse.com
www.ims-ieee.org/about-ims/past-and-future-ims

9–11 June 2026
PCIM 2026 (Expo & Conference on Power Electronics, Intelligent Motion, Renewable Energy and Energy Management)
Nuremberg, Germany
E-mail: pcim_visitors@mesago.com
www.mesago.de/en/PCIM/main.htm

14–18 June 2026
2026 IEEE/JSAP Symposium on VLSI Technology & Circuits
Hilton Hawaiian Village, Honolulu, HI, USA
E-mail: vlsi@vlsisymposium.org
www.vlsisymposium.org

28 June – 1 July 2026
ALD/ALE 2026: AVS 26th International Conference on Atomic Layer Deposition (ALD 2026), featuring the 13th International Atomic Layer Etching Workshop (ALE 2026)
Tampa, FL, USA
E-mail: della@avs.org
https://ald2026.avs.org

26–28 August 2026
PCIM Asia Shenzhen 2026 (International Exhibition and Conference for Power Electronics, Intelligent Motion, Renewable Energy and Energy Management)
Shenzhen, China
E-mail: pcimasia@china.messefrankfurt.com
https://pcimasia-shanghai.cn.messefrankfurt.com

4–9 September 2026
29th European Microwave Week (EuMW 2026)
ExCel, London, UK
E-mail: eumwreg@itnint.com
www.eumweek.com

14–18 September 2026
Energy Conversion Congress & Expo Europe (ECCE Europe 2026)
Valencia, Spain
E-mail: info@ecce-europe.org
https://ipec2026.org/ecce-europe/

4–8 October 2026
IEEE Energy Conversion Congress & Expo (ECCE 2026)
Vancouver, British Columbia, Canada
E-mail: info@ieee-ecce.org
www.ieee-ecce.org/2026

October 2026
SEMICON West 2026
Moscone Center, San Francisco, CA, USA
E-mail: semiconwest@semi.org
www.semiconwest.org

8–13 November 2026
12th International Workshop on Nitride Semiconductors (IWN 2026)
Kumamoto, Japan
E-mail: info@iwn2026.org
www.iwn2026.jp

9–12 November 2026
IEEE 13th Workshop on Wide Bandgap Power Devices and Applications (WiPDA 2026)
Burlington, Vermont, USA
https://wipda.org/

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