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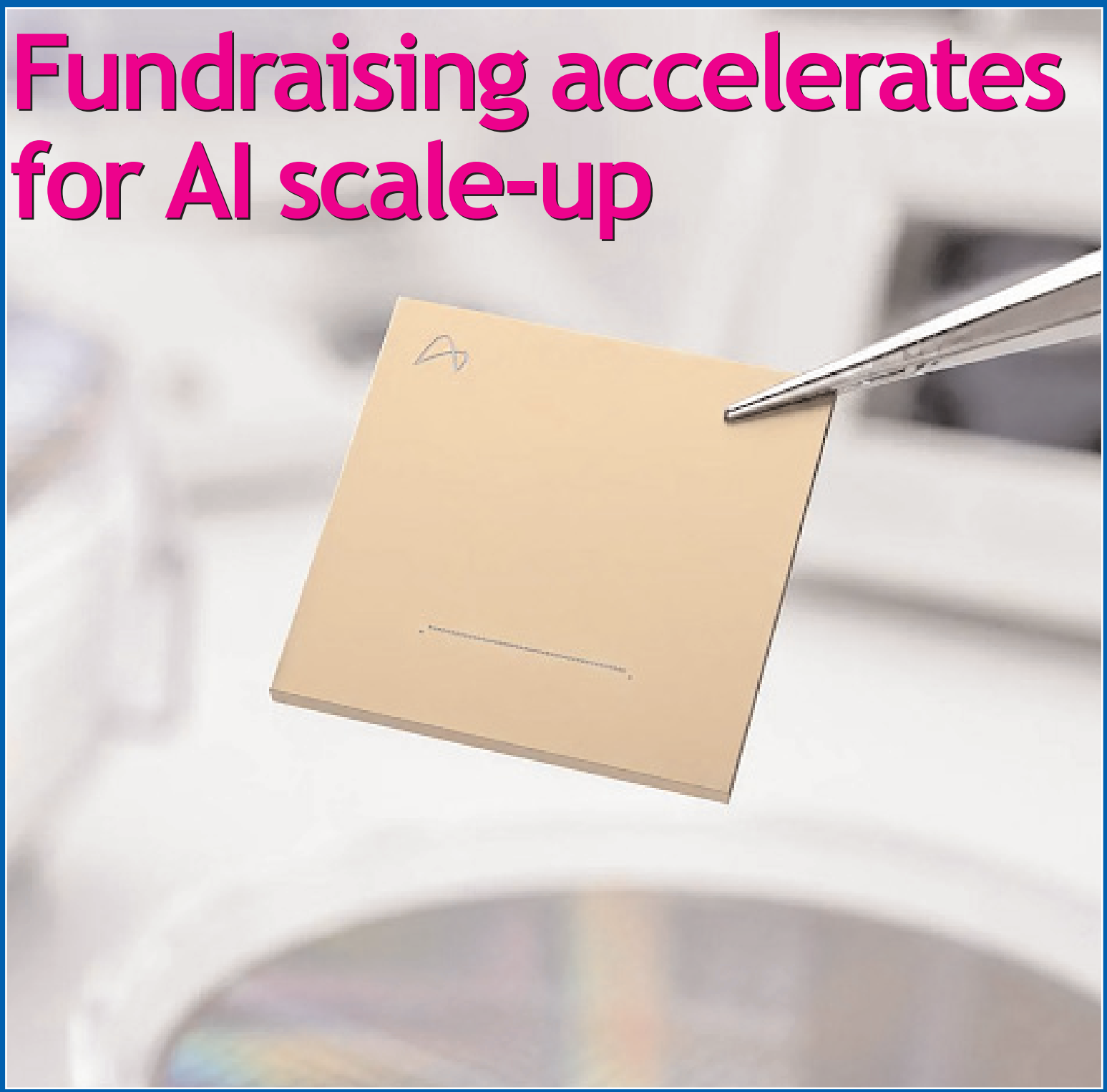
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COMPOUNDS & ADVANCED SILICON

Vol. 21 • Issue 7 • September 2026

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Fundraising accelerates for AI scale-up



5N+ expands in Utah • Teradyne launches micro-LED test system
Sumitomo mass producing 4" InP epi • PicoJool raises $27.5m

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EUROPE: +44 2920 839 400
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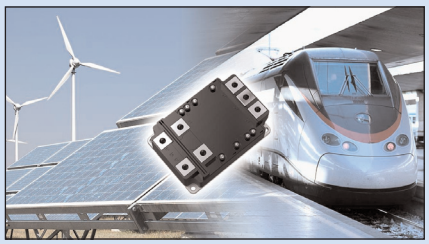
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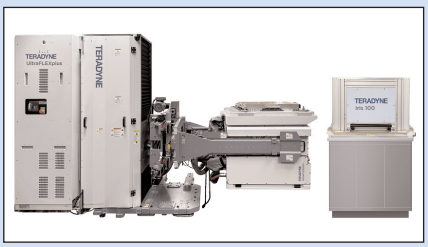
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p24 Northrop Grumman has won a $7m DARPA contract to create diamond-cooled chips.



p43 Teradyne has launched Iris 100, a production-ready optical test platform for micro-LED devices.

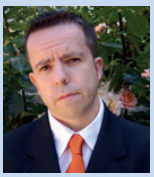


Cover image: Silicon photonics-based chip-to-chip optical connectivity firm Ayar Labs — which is pioneering co-packaged optics (CPO) for AI scale-up — has secured an additional $150m in funding, bringing its total primary capital raised in 2026 to $650m. **p56**

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Editor
Mark Telford
Tel: +44 (0)1869 811 577
Cell: +44 (0)7944 455 602
E-mail: mark@semiconductor-today.com



Commercial Director/Assistant Editor
Darren Cummings
Tel: +44 (0)121 288 0779
Cell:+44 (0)7990 623 395
E-mail: darren@semiconductor-today.com

Advertisement Sales
Darren Cummings
Tel: +44 (0)121 288 0779
Cell:+44 (0)7990 623 395
E-mail: darren@semiconductor-today.com

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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).

Regular issues contain:

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

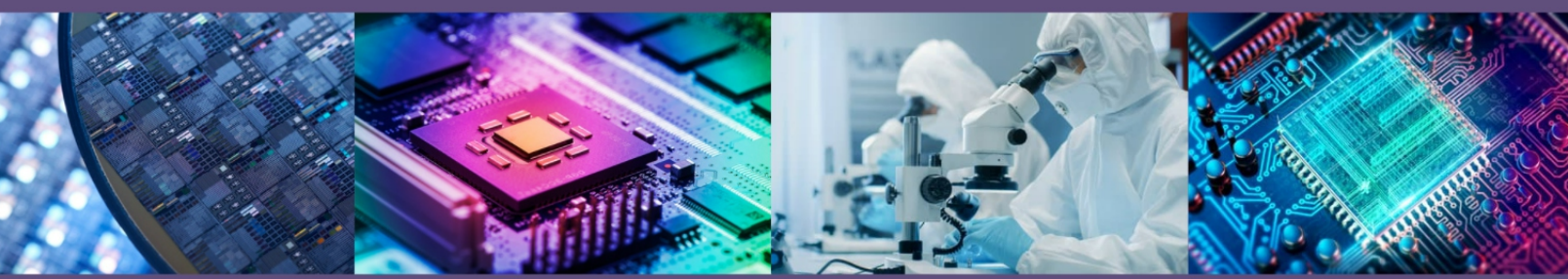
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news

Q2 smartphone production down just 8% year-on-year, to 275 million units

TrendForce's full-year forecast raised from 1.05 billion to 1.07 billion, down 14% year-on-year

Global smartphone production in second-quarter 2026 reached 275 million units, down 8% year-on-year, according to market research firm TrendForce. The decline was narrower than previously forecast, resulting in better-than-expected overall performance.

TrendForce attributes the stronger-than-expected results primarily to two factors: First, some consumers have brought forward smartphone purchases amid concerns that continued memory price increases could further drive up device costs and lead to another round of price hikes for new models in 2027.

Second, some brands had previously cut their production plans too aggressively in response to surging memory costs and are now restoring some of those volumes as market conditions stabilize.

Against this backdrop, TrendForce has raised its forecast for global smartphone production in 2026 from 1.05 billion to 1.07 billion units, with the projected year-on-year decline narrowing from 16% to 14%.

TrendForce stresses that the near-term improvement does not signal a genuine market recovery, but rather reflects a temporary boost from purchases being brought forward. As this effect fades and memory contract prices continue to rise in 2027, global smartphone production could face greater downward pressure.

Samsung ranked first in Q2/2026 with production of 62 million units, up about 7% year-on-year, supported by the later launch timing of its new flagship models. The firm has significantly increased its reliance on ODM production for entry-level and mid-range models to offset high memory costs, leveraging ODM suppliers' design flexibility and manufacturing cost advantages to maintain price competitiveness.

Major Global Smartphone Brands by Production in 2Q26 (unit: Mpcs)

Rank	Brand	Production	QoQ	YoY	Market Share
1	Samsung	62	-1%	7%	23%
2	Apple	52	-13%	14%	19%
3	Oppo	30	3%	-17%	11%
4	Xiaomi	29	8%	-32%	10%
5	vivo	21	-3%	-18%	8%
6	Transsion	20	0%	-27%	7%

Apple ranked second with production of about 52 million units, up about 14% year-on-year. Growth was driven primarily by the effective pricing strategy of the iPhone 17 series, which supported strong sales performance through the first three quarters. However, price increases for the upcoming iPhone 18 series appear inevitable, making their potential impact on sales momentum a key factor to watch.

OPPO, Xiaomi and vivo ranked third through fifth, with production of about 30 million, 29 million and 21 million units, respectively. The three brands have shifted away from aggressive strategies aimed at gaining market share and are instead focusing on maintaining their existing positions while preventing further deterioration in profitability. OPPO and vivo, in particular, derive a substantial share of their sales from China, where Huawei's aggressive market share expansion is creating mounting competitive pressure.

Transsion ranked sixth with production of nearly 20 million units in Q2/2026, down about 27% year-on-year. With its portfolio concentrated primarily on entry-level and low-end smartphones, and with lower inventories of lower-cost memory than its competitors, the company has been more heavily affected by the current surge in memory prices.

Near-term rebound does not signal a market turnaround; outlook remains uncertain

Overall, TrendForce notes that the upward revision to its full-year production forecast primarily reflects the temporary effects of purchases being brought forward and brands restoring previously reduced production plans, rather than a fundamental improvement in market conditions. The outlook for the global smartphone industry will require close monitoring as this demand fades and memory cost pressures persist into 2027, the firm concludes.

www.trendforce.com

As AI models scale 100x every two years, Yole maps shift from compute to communication

Optical transceiver market growing at 35% CAGR to $112bn by 2031

In Yole Group's White Paper 'Photonics at the Speed of AI' (part of the firm's AI White Papers Collection), it argues that optical transceivers — once a supporting piece of data-center infrastructure — have become a system-level requirement for scaling artificial intelligence.

For most of the past decade, optical transceivers were infrastructure: important, technically demanding, but infrastructure nonetheless. According to Yole Group, that era is over. When a cluster of tens of thousands of GPUs is built to train a single model, compute is only as useful as the communication fabric that holds it together: latency stalls synchronization, bandwidth throttles utilization, and interconnect power competes directly with compute power. The bottleneck has migrated to the wire, the fiber, and the components that convert between them.

"AI makes photonics a system requirement, not an optional enhancement," says Martin Vallo PhD, senior technology & market analyst, Photonics. "The bottleneck is shifting from compute to communication."

To make sense of that shift, Yole's White Paper introduces a four-domain framework, Scale-In, Scale-Up, Scale-Out, Scale-Across, reflecting how interconnect engineers think about the problem today. Each layer has a different technology entry point, a different incumbent to displace, and a different commercialization timeline.

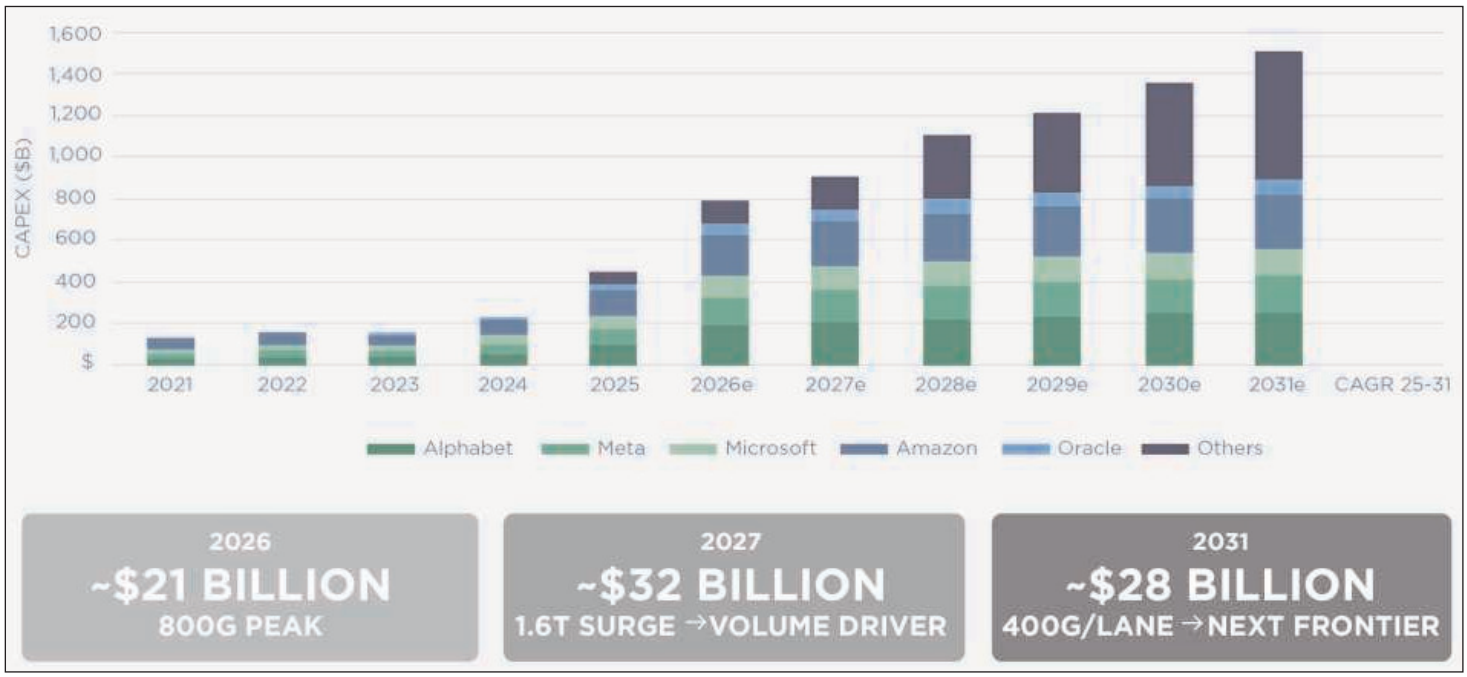
The picture is neither a simple 'copper is dying' narrative nor a 'CPO will solve everything' announcement: copper is being extended deliberately through megawatt-class rack engineering, while co-packaged optics (CPO) is entering commercial deployment narrowly, in proprietary switching platforms, for the handful of players vertically integrated enough to absorb its manufacturing risk.

The scaling math is stark. AI models grow roughly 100x every two years while compute improves only about 3.3x, pushing the industry to deploy about 70x more interconnects every two years — a rate the optics module industry is not currently equipped to sustain. That pressure flows directly into the transceiver market: from about $10bn in 2021 to a forecast $112bn in 2031 (~35% CAGR), fueled by hyperscaler CapEx projected to reach $670bn in 2026 alone, and a combined $5.3 trillion between 2026 and 2031.

The White Paper also maps where pluggable optics are headed next, evolving through LPO, XPO and the Open CPX ecosystem toward optical conversion progressively closer to the GPU and CPU package. Yole's new market & technology report 'Co-Packaged Optics for Data Centers 2026' quantifies that shift: CPO optical-engine revenue is forecast to grow from $0.6bn (2026) to $112.1bn (2031), with scale-up applications alone expected to capture about 94% of that market.

"As AI infrastructure scales globally, the industry's primary constraint is shifting," notes founder & president Jean-Christophe Eloy. "The question is no longer simply which accelerators can be deployed, but whether the networking and photonic technologies required to connect them will be available at the right scale, at the right time, and at the right cost."

www.yolegroup.com/white-papers/



CSconnected celebrates impact of Strength in Places Fund program

Funders, delivery partners and industry colleagues gather to celebrate outcomes, impact and legacy of five-year program

On 10 September the South Wales-based compound semiconductor cluster CSconnected Ltd brought together funders, delivery partners and industry colleagues to celebrate the outcomes, impact and legacy of its Strength in Places Fund (SIPF) program, which concluded in May.

Held at CS^2 Imperial Park, Newport, the event reflected on five years of growth, collaboration and innovation delivered through the UK Research and Innovation (UKRI)-backed program, which ran from 2021 to 2026 to accelerate high-growth regional clusters through investment in research, advanced manufacturing and skills.

The day saw a series of talks, showcasing the impact of the project; from new innovations, to economic impact and skills outreach.

Findings from CSconnected's Strength in Places Fund Impact Report 2026, published earlier in 2026, illustrate the scale of the impact that investment has had both for the people of Wales and beyond, including:

- direct employment increased by 36% to 1914 jobs;
- total Welsh jobs supported rose by 51% to 3140;
- total Welsh gross value-added (GVA) nearly doubled, reaching £436m;
- annual sales grew to £531m.

"The Strength in Places program has achieved incredible impact and CSconnected has proved to be an invaluable partner for Welsh Government," said Adam Price, its Cabinet Minister for Enterprise, Connectivity and Energy. "The South Wales compound semiconductor cluster is world leading, with unrivalled access to innovation funding, government support and collaborative research programs providing the foundations to power the technologies of tomorrow, attracting significant investment and creating high-value jobs," he added.

"The UKRI funding from the Strength in Places Fund has seen our ambition of growing and building in Places put into action by CSconnected, who have become a thriving, competitive semiconductor cluster for the UK," commented Dame Jessica Corner, executive chair for Research England.

"Bringing together the strong partnerships and extensive collaboration within the semiconductor cluster in South Wales has powerfully supported economic productivity, creating over 500 new jobs and over 40 new products. I look forward to CSconnected building on this success as it moves into its next phase of development," she added.

"The SIPF program is the perfect example of what state-funded investment should deliver: skills development, job creation, attraction of inward investment and the benefits this brings to the Welsh and UK economy," stated CSconnected's managing director Howard Rupprecht. "We are excited to move into the next stage of our impact with a clear ambition: to grow the cluster revenue to £1bn and deliver 6000 jobs in the region by 2030."

Looking ahead, CSconnected says that it will focus on deepening UK-wide supply chain integration, expanding international partnerships and supporting emerging market opportunities across 6G communications, AI, clean energy and advanced manufacturing.

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5N+ awarded US$7.3m to establish US production of GaAs components for defence applications

Utah facility to gain crystal-growth and GaAs compounding equipment

Specialty semiconductor and performance materials producer 5N Plus Inc (5N+) of Montréal, Québec, Canada has been selected by the US Department of War to receive a US$7.3m award to establish domestic production of gallium arsenide components for US defence applications. This follows presentation of the firm's proposal at the inaugural Defense Industrial Base Accelerator (DIBX) Pitch Competition in Philadelphia (25–27 August).

Gallium arsenide (GaAs) is used in advanced sensing systems and other devices for defence applications. With no qualified domestic source of GaAs electro-optical components currently available, US defence contractors rely on foreign suppliers. The proposed award would help to address this critical supply chain gap by establishing a qualified US source at 5N+'s production facility in St. George, Utah, strengthening domestic supply security and supporting an immediate defence requirement.

"Our selection by the US government recognizes 5N+ as a trusted strategic partner to the US defence industrial base, with the proven expertise and ability to support critical national security priorities," says president & CEO Richard Perron. "This award will enable us to establish a secure domestic source for an immediate defence requirement, while also creating a scalable platform to pursue significant long-term market opportunities across a broader range of defence and space applications over time."

Building on its existing capabilities, 5N+ intends to expand its Utah operations by adding crystal-growth and GaAs compounding equipment, and implementing the necessary process controls and inspection capabilities. The firm will work with an initial customer, US-based global defence technology company Lockheed Martin, to complete product qualification before advancing to controlled, low-rate production, with a potential path to a follow-on production agreement.

The capabilities that will be developed at the firm's Utah facility could also support future production of GaAs substrates and other advanced semiconductor materials for additional defence and space applications, including space solar cells and high-frequency semiconductor devices. This would broaden 5N+'s addressable market and create significant long-term growth potential, it is reckoned.

www.5nplus.com

ATEK MIDAS showcasing MMIC & custom ICs at EuMW

Firm exhibiting alongside technical sales rep Antae

At the 29th European Microwave Week (EuMW 2026) at ExCeL London, UK (4–9 October), ATEK MIDAS AS of Istanbul, Turkey — which designs high-performance analog, mixed-signal silicon ASICs & RFICs and gallium arsenide (GaAs) & gallium nitride (GaN) monolithic microwave integrated circuits (MMICs) and modules — is exhibiting in booth L108 alongside its technical sales representative Antae (which covers UK, Spain, Portugal and Ireland).

Visitors can preview new MMIC components and learn about ATEK MIDAS' growing portfolio of high-performance MMIC products, including switched and digitally tunable filters, GaN power amplifiers, low-noise amplifiers, high-power switches, and custom RFIC and ASIC design services. Designed for demanding defense, aerospace, test & measurement, satellite communications, and commercial applications, ATEK MIDAS solutions help customers to accelerate development and optimize system performance.

The ATEK MIDAS, ATEK America and Antae teams are available during the exhibition to discuss customer requirements, system architectures, custom IC development programs, and standard product solutions covering frequencies through 100GHz.

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SEMI joins ReSiLient consortium to strengthen Europe's silicon and SiC raw material value chains

SEMI Europe to lead Work Package 8 on Social Acceptance, Dissemination, Communication and Standardization

Global industry association SEMI has joined the ReSiLient project consortium to help fortify Europe's semiconductor ecosystem and advance global supply chain resilience. Kicking off in 2026, the project aims to tackle Europe's critical dependence on imported silicon (Si) and silicon carbide (SiC) raw materials.

As part of SEMI's participation, SEMI Europe will serve as lead partner for the project's Work Package 8 (WP8), Social Acceptance, Dissemination, Communication and Standardization. Co-funded by the European Union under the Horizon Europe program (Grant Agreement No. 101294649), the ReSiLient project — Innovative Primary Substitution and Secondary Valorisation Routes for Europe's Silicon and Silicon Carbide Semiconductor Raw Material Value Chains — is a 48-month, €9.57m Innovation Action bringing together 18 partners from across nine European countries.

"Securing Europe's access to silicon and silicon carbide is no longer simply a materials challenge — it is a strategic industrial imperative," says Laith Altimime, president of SEMI Europe. "ReSiLient tackles the critical raw material bottlenecks at the very foundation of Europe's semiconductor and power device industries," he adds. "SEMI Europe is committed to ensuring these results reach the industrial stakeholders who can turn them into action. By strengthening the resilience of Europe's raw material supply, ReSiLient will help reinforce Europe's semiconductor ecosystem, competitiveness, and global leadership."

The project addresses four strategic objectives:

1. Supply chain resilience — Map critical dependencies across the Si and SiC value chains, validate domestic and secondary feedstocks including olivine, aplite and Si-rich industrial waste streams, and align new production routes with the Critical Raw Materials Act, European Chips Act, Net-Zero Industry Act and EU Emissions Trading System.
2. Sustainable production at scale — Develop and demonstrate two integrated production routes: a primary route based on domestic mineral sources, and a secondary route based on industrial by-products and waste streams, using hydrometallurgical leaching, agglomeration, hydrogen plasma refining and carbothermic conversion to deliver metallurgical-grade silicon and high-purity silicon carbide at pilot scale.
3. Semiconductor qualification — Validate the purity and performance of project-produced Si, MG-Si and SiC for real semiconductor manufacturing, including Czochralski crystal growth and SiC boule production, benchmarked against commercial feedstock by end-users STMicroelectronics Silicon Carbide AB and Infineon Technologies.
4. Competitiveness and exploitation — Benchmark both production chains against conventional baselines on cost, carbon footprint and supply security, and define clear commercial pathways, intellectual property rights (IPR) frameworks and regulatory compliance strategies for scale-up.

The ReSiLient consortium spans the full microelectronics value chain: Sintef, Luxchemtech Gmbh, Fiven Norge, Bifa Umweltinstitut Gmbh, Ethnicon, Metsovion Polytechnion, Steinsvik Olivine AS, Konlechner David, Wacker Chemie AG, SEMI Europe Gmbh, L'urederra, Fundacion Para El Desarrollo Tecnoles, Stmicroelectronics Silicon Carbide AB, Infineon Technologies AG, Chemconserve BV, Topsil Globalwafers AS, MEMC Electronic Materials SpA, SCR-Sibelco NV, Infineon Technologies Dresden AG & Co, UVR-FIA Verfahrensentwicklung Umweltschutztechnik.

As lead of WP8, SEMI Europe will drive stakeholder engagement across at least 10 European member states, coordinate communication activities anchored around key industry events including SEMICON Europa 2026 in Munich, Germany (10–13 November), develop standards and chair the project's external Technical Advisory Group.

www.semiconeuropa.org
www.resilient-semiconductors.eu



DB HiTek completes reliability qualification for 8-inch 1200V SiC MOSFET process

Firm establishes first complete 8-inch SiC foundry process flow

Pure-play 8-inch specialty foundry DB HiTek of Seoul, South Korea has completed reliability qualification for its 1200V silicon carbide (SiC) MOSFET process on 8-inch (200mm) wafers. This marks a step in its expansion into the 8-inch SiC foundry market. Building on completion of this qualification, DB HiTek plans to strengthen product development support for customers, secure new customers and accelerate preparations for volume production in 2027.

While 6-inch wafers currently dominate the SiC market, major global semiconductor manufacturers are transitioning to 8-inch wafers to improve production efficiency and cost competitiveness. DB HiTek has responded to this market transition by developing 8-inch SiC process technology and building its foundry service capabilities.

Through optimization of its high-power SiC MOSFET process, DB HiTek says that it has achieved competitive electrical characteristics and a high level of reliability. The firm has established what it claims is the first complete 1200V 8-inch SiC foundry process flow, creating a foundry service platform capable of supporting customers across design, manufacturing, electrical characterization and reliability qualification.

To support the commercial rollout of its 8-inch SiC foundry business, DB HiTek is providing customers with process design kits (PDKs) for its proprietary first- and second-generation 1200V SiC MOSFET processes. A third-generation PDK is scheduled for release this November. By using these PDKs, customers can reduce the resources required during the initial stages of development, accelerate prototype fabrication and shorten product development time by more than a year, it is reckoned.

The second-generation process covered by the PDK achieves a specific on-resistance (R_{sp}) of 2.5mΩ•cm^2 or less and a threshold voltage (V_{th}) of 3V or higher at an on-state gate voltage ($V_{gs(on)}$) of 18V. It has also completed reliability qualification, a demanding stage of process development.

The third-generation process, scheduled for release in November, is being qualified with the goal of achieving a specific on-resistance of 2.3mΩ•cm^2 or less at the same on-state gate voltage of 18V, together with a short-circuit withstand time (SCWT) of at least 2.5μs in the short-circuit safe operating area (SCSOA). Once qualification is complete, DB HiTek plans to make the third-generation PDK available to customers.

DB HiTek plans to complete process preparations and provide access to longstanding customers in third-quarter 2026. It plans to make the service available to all customers beginning in second-quarter 2027.

"The completion of reliability qualification for our 1200V SiC MOSFET process is significant because it demonstrates that we have secured the core process technology and manufacturing foundation required to provide the world's first 8-inch SiC foundry service," says DB HiTek. "We will continue preparing for 8-inch SiC volume production in 2027, with the aim of establishing a position in the market and strengthening our competitiveness in the next-generation power semiconductor foundry sector."

www.dbhitek.com/en

ROHM's silicon carbide used in electric powertrain of BMW's 'Neue Klasse' Gen 6 EVs

ROHM Semiconductor says that its silicon carbide (SiC) power semiconductor chips are being used in the electric powertrain architecture of BMW's 'Neue Klasse' Gen 6 electric vehicle platform.

The high-performance components integrated into the vehicle support key power electronics functions and are designed to deliver high energy efficiency as well as reliable operation under demanding automotive conditions, contributing to optimizing the driving range, charging performance, and the overall energy efficiency of electric vehicles.



"Integration of our SiC MOSFETs into BMW's Gen 6 of electric vehicles – better known as Neue Klasse – highlights ROHM's technological expertise in automotive power electronics," says Wolfram Harnack, president of Germany-based ROHM Semiconductor GmbH: "We are proud to contribute to the advancement of next-generation electric mobility together with BMW Group through our SiC technology. It underlines our long-term commitment to supporting our automotive customers with high-quality and highly reliable products."

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

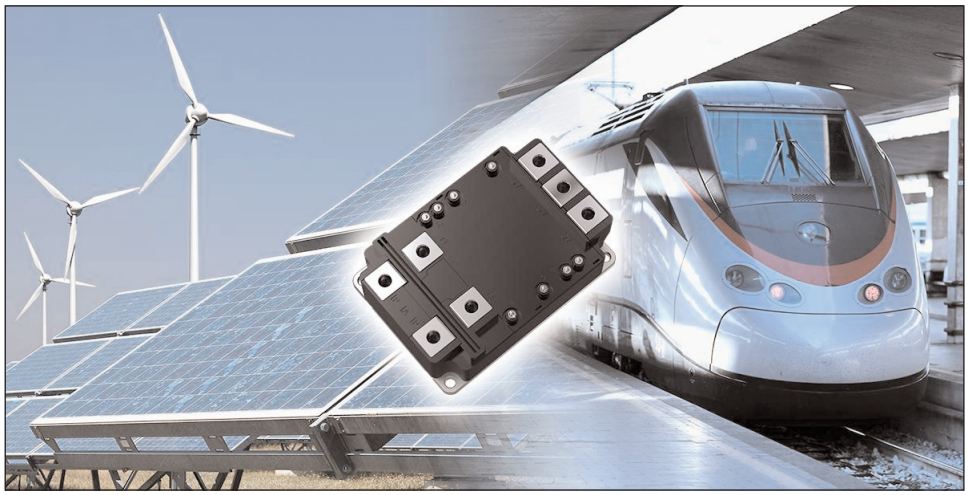
Toshiba launches 3300V SiC MOSFET module

High-surge-current capability helps to improve industrial equipment reliability

Toshiba Electronic Devices & Storage Corp (TDSC) of Kawasaki, Japan has launched the IX800FXF2YMS4, a dual SiC MOSFET module for industrial equipment, including railway vehicles, renewable energy power generation systems and power conversion systems. The new module features Toshiba's third-generation silicon carbide (SiC) MOSFET chips, a drain–source voltage rating of 3300V and a drain current (DC) rating of 800A. Its specifications state an I^2t limit value in the diode section (an indicator of surge current capability).

Manufacturers of industrial equipment, including railway traction inverters and converters, renewable energy power generation systems, and industrial motor control equipment, must constantly meet increasing demands for higher efficiency, smaller size and improved reliability. In these systems, large surge currents that can flow through power semiconductor modules in abnormal conditions must be countered by a sufficient surge current capability.

The IX800FXF2YMS4 has an optimized SiC chip design and delivers an I^2t characteristic of 300kA^{2}s (at $T_{ch(initial)}$=175°C, V_{GS}=–6V, half sine-wave 10ms 1pulse, F.R.=1%), an indicator of the diode section's surge current capability under abnormal conditions.



Toshiba's IX800FXF2YMS4, a 3300V, 800A dual SiC MOSFET module.

The module has a low drain–source on-voltage (sense) ($V_{DS(on)sense}$) of 1.4V (typical, at I_D=800A, V_{GS}=+20V, T_{ch}=25°C), which helps to reduce conduction losses. Its low turn-on switching loss (E_{on}) of 185mJ and turn-off switching loss (E_{off}) of 175mJ (typical, at V_{DD}=1800V, I_D=800A, V_{GS}=+20V/–6V, C_{gs}=100nF, $R_{G(on)}$=1.2Ω, $R_{G(off)}$=1.2Ω, T_{ch}=175°C, L_S=70nH) help to reduce switching losses. These characteristics contribute to improved equipment reliability and efficiency, and to smaller cooling systems.

The new product adopts the intelligent fleXible Package Low Voltage (iXPLV), which offers excellent mounting compatibility. It uses silver sintering bonding technology to improve the heat resistance and reliability of bonded sections with SiC chips, achieving the 175°C channel temperature rating required for industrial equipment.

The new addition to Toshiba's lineup brings the number of SiC MOSFET modules in the iXPLV package to four, broadening the range of available product options.

Toshiba says that it will continue to expand its lineup of SiC MOSFET modules for industrial equipment and provide a wider range of product options that meet diverse equipment specifications and applications, contributing to more reliable, efficient and compact industrial equipment.

www.toshiba.semicon-storage.com/ap-en/semiconductor/product/power-semiconductors.html

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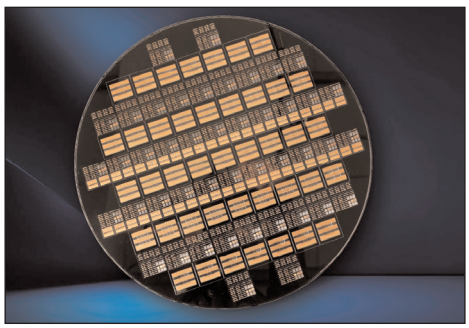
onsemi unveils Embedded Power Platform

Architecture uses silicon wafer as package and introduces highly integrated approach to power system design

Intelligent power and sensing technology firm onsemi of Scottsdale, AZ, USA has unveiled the Embedded Power Platform (EPP), an architecture that uses the silicon wafer itself as the foundation of the package and introduces a highly integrated approach to power system design. Designed as a scalable platform, EPP brings electrical, mechanical and thermal design together from the outset to help customers achieve higher power density, improve system performance and accelerate development in AI, electrification and autonomous applications.

"For decades, the semiconductor and the package have been treated as separate technologies. EPP changes that by making the silicon itself part of the system architecture," says president & CEO Hassane El-Khoury. "EPP brings together advanced semiconductor technologies, manufacturing and system-level optimization into a common architecture that can evolve alongside future innovations. This approach can redefine how power systems are built and create a new foundation for AI infrastructure, electrification and automation."

onsemi says that EPP reimagines the package from passive housing into an active contributor to system performance. By using the silicon wafer itself as the package, EPP enables the seamless integration and interconnection of silicon, silicon carbide (SiC) and gallium nitride (GaN) technologies within a highly integrated wafer-level architecture. Multiple devices, including FETs, drivers and controllers, can be embedded together in a single package and co-optimized for electrical, thermal and mechanical performance. This enables complete power system co-design, allowing electrical, thermal and mechanical characteristics to be evaluated and optimized together from day one. The result is higher power density, improved system performance, reduced development complexity, and faster time-to-market.



Embedded Power Platform wafer.

EPP also leverages onsemi's standard 12-inch silicon wafer manufacturing capabilities, bringing key integration processes into the precision and control of the fab. This applies mature semiconductor design tools, wafer-level manufacturing and advanced simulation capabilities to power system integration, helping to improve performance while accelerating innovation.

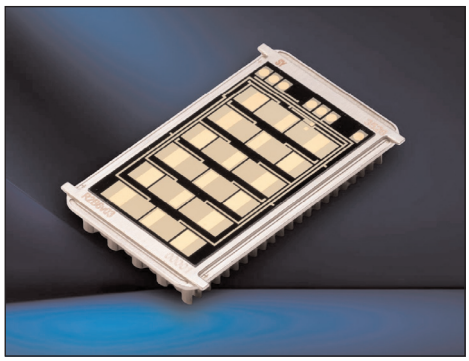
Subaru Corp is one of the first early-engagement partners for EPP, working with onsemi to evaluate how the platform could support future electrified vehicle architectures. Through the collaboration, Subaru will gain early access to engineering samples, simulation models and technical expertise as the companies explore opportunities to improve vehicle performance, streamline development and accelerate innovation.

AI infrastructure, electrified transportation and industrial automation are all competing for the same critical resource: power. Customers need to move and manage more electricity within increasingly compact systems while controlling heat, efficiency, cost and development time. Yet many of today's power systems are still developed using traditional design approaches that treat power electronics, mechanical design and thermal design as separate engineering challenges, with each layer optimized independently and sequentially. Decisions made at one stage can create compromises in another, leading to additional engineering iterations, costly late-stage changes and longer development cycles.

EPP replaces that sequential model with a common platform that can be co-designed, co-simulated and co-optimized. This approach is designed to help customers:

- achieve 3–5x higher power density, depending on the application;
- accelerate development cycles to as little as four months;
- improve thermal performance and heat dissipation;
- reduce electrical losses through lower parasitic inductance;
- enable greater device control and higher switching frequencies;
- identify design trade-offs earlier and reduce costly late-stage changes;
- scale a common architecture across power levels, device types, applications and semiconductor technologies.
- AI infrastructure applications: As AI rack power increases, more space and cooling capacity must be dedicated to the systems that deliver, convert and protect that power. This can limit how much compute capacity can fit within a rack. In an early EPP-based solid-state circuit-breaker design, the solution was about 50% smaller and 20% cooler than existing designs. By reducing packaging overhead and using the full EPP footprint to conduct heat, EPP can support more compact power systems, improve thermal management and enable greater power density in AI infrastructure.
- Electric vehicle applications: Electric vehicle traction inverters are often constrained by efficiency losses, thermal limitations, develop-

ment complexity and system size. EPP addresses these challenges with up to 4x higher power density and 15% lower power losses compared to conventional approaches, enabling smaller, lighter and more efficient inverter designs. Its scalable architecture supports a single inverter platform spanning low-end to high-end vehicle applications, allowing automakers to reuse a common design across multiple vehicle models and power classes. This approach can reduce R&D and manufacturing costs, accelerate qualification and development cycles, improve vehicle range or lower system costs,



Embedded Power Platform chip.

and help bring new vehicle programs to market faster.

The AI era is creating new infrastructure challenges that cannot be solved by computing power alone, says onsemi. As power becomes one of the defining constraints on future innovation, EPP is said to represent a fundamentally new approach to how energy is delivered, managed and optimized. By turning the silicon wafer into the package itself, onsemi says that it is establishing a foundation for the next generation of AI, electrification and autonomous systems.

EPP is expected to begin sampling in 2026 with strategic customers and ecosystem participants across automotive and AI applications.

www.onsemi.com

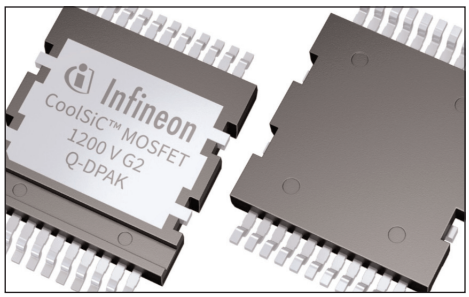
Infineon supplying SiC power semiconductors to Fox ESS

CoolSiC MOSFETs 1200V G2 in top-side-cooled Q-DPAK package enhancing efficiency of residential energy storage systems

Infineon Technologies AG of Munich, Germany is supplying silicon carbide (SiC) power semiconductors to renewable energy solutions provider Fox ESS Co Ltd of Wenzhou, China to enhance the efficiency of its residential energy storage systems (ESS). Leveraging Infineon's CoolSiC MOSFETs 1200V G2 in the Q-DPAK package, Fox ESS has reduced switching losses by 70%. As a result, the company's PQ3-Ultra energy storage system achieves a peak photovoltaic (PV) inverter efficiency of up to 98.78% in grid-tied operation and a peak battery charge/discharge efficiency of up to 98.47%.

"With our SiC MOSFETs in the Q-DPAK package, we are enabling a new level of efficiency, thermal performance and design flexibility for residential energy storage systems," says Amit Raut, application manager Photovoltaic and Residential ESS at Infineon. "Fox ESS is demonstrating how advanced SiC technology can translate into measurable system-level gains and support the broader adoption of clean energy solutions in homes worldwide."

"The collaboration with Infineon is a major pillar of our strategy to



Infineon's CoolSiC MOSFETs 1200V G2 in top-side-cooled Q-DPAK package.

deliver high-performance energy storage solutions," says Daniel Deng, R&D director at Fox ESS. "Infineon's CoolSiC technology offers superior efficiency and outstanding reliability," he adds. "By working together, we will further advance the performance of residential energy storage systems and accelerate the adoption of renewable energy."

Within Fox ESS's energy storage system, Infineon's CoolSiC MOSFETs 1200V G2 in the top-side-cooled Q-DPAK package are said to deliver optimized thermal performance, system efficiency and power density. The devices are specifically designed for demanding applications requiring high performance and reliability. Featuring Infineon's .XT interconnection technology, they reduce thermal resistance and operating junction temperature, while the trench gate architecture helps to lower switching losses. Compared with conventional bottom-side-cooled designs, the Q-DPAK package supports improved PCB layout, helping to reduce parasitic effects and stray inductance while enabling superior thermal management, it is claimed. Its compact footprint supports space-saving system designs, while compatibility with automated assembly simplifies cost-efficient, scalable manufacturing.

For its hybrid ESS solution combining the PQ-H3-Ultra-10.0 inverter with the EQ3300-5 battery, Fox ESS has achieved a System Performance Index (SPI) of 97.0% in a recent test by HTW Berlin University of Applied Sciences and AQUU Research. This ranks Fox ESS first in the 10kW class among all hybrid inverter and storage systems tested in 2026 and marks the highest SPI score recorded since the evaluation was launched in 2018. Over the past three years, Fox ESS has installed more than 890,000 PV inverters and over 1 million batteries in more than 70 countries.

www.fox-ess.com
www.infineon.com/coolsic

Infineon & Skeleton collaborate on solid-state transformers and sidecars to enhance AI data-center resilience

CoolSiC power semiconductors to be combined with power conversion systems and supercapacitor technology

Infineon Technologies AG of Munich, Germany and Skeleton Technologies, which provides high-power energy storage systems for AI data centers, have signed a memorandum of understanding (MoU) to collaborate on high-efficiency, resilient power solutions for modern data centers.

The rapid growth of AI, increasing power demand and the need for highly reliable digital infrastructure are driving a new generation of power architecture. Solid-state transformers (SSTs) and high-power sidecars are increasingly important building blocks for AI data-center infrastructure. They enable more efficient power conversion from grid to core and higher system resilience. Accordingly, the two companies aim to advance these technologies to improve energy efficiency and system performance throughout the power delivery chain.

"AI is fundamentally transforming power infrastructure requirements. The increasing power density of modern data centers calls for new approaches to energy conversion, distribution and storage," says Andreas Weisl, executive VP & chief sales officer of Industrial and Infrastructure at Infineon. "By combining Infineon's expertise in power semiconductors with Skeleton's innovation in supercapacitor technology and power conversion systems, we are driving the development of highly efficient and resilient power architectures that meet the demands of next-generation AI workloads," he adds.

"Power density is becoming one of the defining constraints of AI infrastructure globally," notes Skeleton's CEO Taavi Madiberk. "AI data centers need to deliver dramatically more power to increasingly dense GPU infrastructure, without allowing the power system itself to consume more space. Infineon and Skeleton Technologies are both working at the forefront of that challenge," he adds. "By combining Infineon's precision in converting and controlling power with Skeleton's expertise in storing and delivering very high power at speed, we can increase power density across the AI power infrastructure and enable more compute within the same physical footprint."



Solid-state transformers (SST) and high-power sidecars are increasingly important building blocks for AI data-center infrastructure.

By combining Infineon's precision in converting and controlling power with Skeleton's expertise in storing and delivering very high power at speed, we can increase power density across the AI power infrastructure and enable more compute within the same physical footprint

Infineon and Skeleton will jointly explore and develop advanced architectures for the entire AI data-center power chain that delivers electricity from grid to core. This includes next-generation SSTs for medium-voltage AC to high-voltage DC conversion. The firms intend to combine Infineon's high-efficiency high-voltage CoolSiC power semiconductors with Skeleton's expertise in power conversion systems and supercapacitor technology.

The companies are also collaborating on gallium nitride (GaN)-based peak-shaving systems that combine Skeleton's advanced supercapacitor technology with Infineon's CoolGaN power semiconductors. By bringing together complementary technologies and system-level know-how, the collaboration aims to deliver breakthrough improvements in energy efficiency, power density and system reliability while helping to reduce the total cost of ownership for data-center operators.

www.infineon.com

Infineon extends collaboration with SolarEdge to solid-state circuit breakers for 800VDC AI data centers

CoolSiC JFET technology at the core of the protection devices

Infineon Technologies AG of Munich, Germany and smart energy firm SolarEdge Technologies Inc of Milpitas, CA, USA have extended their collaboration to advance solid-state circuit breaker (SSCB) technology for high-voltage DC distribution in AI and hyperscale data centers. The collaboration addresses a key challenge in the adoption of 800VDC architecture: Safe operation of increasingly power-dense infrastructure requires very fast fault-isolation to achieve selectivity while maintaining high efficiency.

Extending the collaboration to solid-state protection addresses a critical gap in the distribution layer between the solid-state transformer (SST) and the compute rack, advancing a comprehensive grid-to-rack solution. SolarEdge is leading the design of the SSCB solution, with Infineon providing its silicon carbide (SiC) JFET technology at the core of the protection devices.

As rapidly increasing AI compute density drives the industry toward higher-voltage DC distribution, solid-state circuit breakers address one of the most fundamental challenges in enabling safe and reliable operation. Unlike conventional alternating current (AC) systems, DC protection presents a different engineering challenge. Without a natural current zero, mechanical interruption faces challenges with arcing. It is comparatively slow and, as such, requires a different approach to circuit protection than conventional AC systems. Solid-state circuit breakers are designed to interrupt faults within a few microseconds, with no mechanical contacts to separate, while Infineon's CoolSiC JFET devices deliver efficient operation and superior robustness. Together, these capabilities help to protect high-value compute equipment and enable more compact, higher-density DC distribution designs.

The collaboration builds directly on SolarEdge's SST platform with Infineon SiC components, first announced in November 2025. The SST is designed to enable direct medium-voltage (13.8–34.5kV) to 800–1500VDC conversion at over 99% efficiency, collapsing multiple conversion stages into a single solution while reducing physical footprint.

"High-density AI infrastructure at 800VDC demands uncompromising efficiency and protection," says SolarEdge's CEO Shuki Nir. "Solid-state protection will enable operators to achieve both, delivering ultra-fast and dependable fault isolation without sacrificing conversion performance. Infineon's silicon carbide technology is what makes it practical at scale," he adds.

"Today's data infrastructures have become more vulnerable to electrical faults, thereby driving the demand for smarter, faster and more robust power distribution systems," says Andreas Weisl, executive VP & chief sales officer of Industrial & Infrastructure at Infineon. "By combining our advanced silicon carbide JFET technology with SolarEdge's expertise in final power distribution, we are addressing these demands to ensure fast, safe and reliable operations in AI data centers."

Building on more than 15 years of experience in DC-coupled power electronics, SolarEdge is developing an 800VDC powertrain for AI factories, a DC-native chain that carries power from the medium-voltage grid connection through conversion, distribution and protection to the compute rack. Infineon's broad portfolio of silicon, silicon carbide and gallium nitride solutions provides that foundation, supporting the decarbonization of AI infrastructure through lower losses, reduced environmental impact, and improved total cost of ownership.

www.solaredge.com
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Navitas ships first US-made Gen 5 GaNFast products from GlobalFoundries

Long-term strategic partnership secures US domestic supply chain for AI infrastructure and critical national security applications

Gallium nitride (GaN) power IC and silicon carbide (SiC) technology firm Navitas Semiconductor Corp of Torrance, CA, USA says that the first shipments of US-manufactured 5th Generation GaNFast technology, in partnership with 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), will begin in September, marking a milestone in strengthening the US domestic GaN ecosystem for AI infrastructure and critical national security applications.

In November 2025, Navitas and GF announced a long-term strategic partnership to accelerate US GaN innovation and domestic manufacturing. Navitas developed its Gen 5 GaNFast FETs and power integrated circuits (ICs) for production at GF's US-based 200mm GaN-on-silicon manufacturing facility in Burlington, Vermont.

The first shipment of the Gen 5 GaNFast family is a milestone in the Navitas–GF collaboration, bringing Navitas' next-generation GaNFast technology into a US production foundry for AI infrastructure, performance computing, industrial electrification, and critical national security applications.

Since 2014, Navitas has established GaNFast FETs and power ICs that integrate power, drive, control, sensing and protection. With over 300 issued and pending patents across GaN and SiC, Navitas has built proprietary expertise in GaN process design kits (PDKs), device architectures and integrated power technologies.

Navitas applied this expertise to optimize its proprietary Gen 5 GaNFast technology and device architectures for manufacturing on GF's 200mm GaN-on-silicon platform. Combined with GF's decades of semiconductor manufacturing expertise and high-volume production capabilities, the partnership is delivering a US-based supply of GaN power semiconductors for AI infrastructure and other critical applications.

"Together with GlobalFoundries, we have established a trusted US-domestic manufacturing source for our GaNFast Gen 5 and future generations, which will play a critical role in powering AI infrastructure and high-performance computing while strengthening the resilience of the US semiconductor ecosystem," says Navitas' president & CEO Chris Allexandre.

"The first shipment from our US manufacturing line demonstrates how GF and Navitas are turning advanced GaN innovation into a secure, scalable domestic supply," says Kannan Soundarapandian, senior VP of GF's power business. "By combining Navitas' power semiconductor leadership with GF's manufacturing expertise, we are enabling the high-efficiency power solutions needed for AI infrastructure and other critical applications while strengthening the resilience of the US semiconductor ecosystem."

The initial product family is expected to include 650V GaN FETs with $R_{DS(ON)}$ values of 11mΩ, 18mΩ, 50mΩ, 120mΩ and 150mΩ, with first wafers scheduled to ship in September, internal samples in October, and strategic customer samples before the end of the year.

www.navitassemi.com
www.gf.com

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Wise Integration's digital control technology to combine with Navitas' wide-bandgap technologies

Collaboration to advance performance computing applications for AI PCs, high-end workstations, gaming desktops and industrial systems

Fabless company Wise Integration SAS of Hyeres, France — which specializes in digital control solutions for wide-bandgap (GaN and SiC)-based power converters — and gallium nitride (GaN) and silicon carbide (SiC) power semiconductor firm Navitas Semiconductor Corp of Torrance, CA, USA have agreed to collaborate on advancing power-computing applications for AI PCs, high-end workstations, desktop computers for gamers, and industrial systems.

The companies will focus on AI data-center power supply units (PSUs) and the exploration of additional power conversion topologies by combining Wise Integration's distributed digital control technology and Navitas' wide-bandgap technologies, including its GaN and SiC technologies, to address high-voltage, high-power and high-efficiency applications from grid-to-chip.

AI data centers and performance computing applications are driving significant growth in energy demand and creating new requirements for efficiency, power density and system performance. In AI data-center PSUs and energy infrastructure, these requirements are also making it necessary to deploy new power conversion architectures to deliver higher efficiency and power density. By combining Navitas' GaN and SiC power technologies with Wise Integration's digital-control expertise, the companies aim to explore new approaches to power conversion.

"Wide-bandgap technologies are unlocking new levels of power density and efficiency, but realizing their full potential requires advanced control," says Wise Integration's CEO Ghislain Kaiser. "With WiseWare [digital control technology designed to boost power density, efficiency, and performance], we bring the digital intelligence needed to optimize power conversion in real time. Combining this capability with Navitas' GaN and SiC technologies can enable more efficient, compact, and high-performance power supply solutions for AI data centers and next-generation computing systems," he adds.

"AI data centers and performance computing applications are creating unprecedented need for solutions that deliver higher efficiency and better power density," notes Vipin Bothra, Navitas' VP, global solution marketing. "By combining Navitas' next-generation GaN and SiC power technologies with Wise Integration's digital-control expertise, we can deliver solutions that help customers address these rapidly evolving system requirements."

www.wise-integration.com
www.navitassemi.com

Ibérica to distribute SemiQ's SiC MOSFETs and Schottkys

SemiQ Inc of Lake Forest, CA, USA has announced a distribution deal with power electronics firm Ibérica Semiconductores de Potencia (ISP) of Madrid, Spain. The partnership expands SemiQ's European reach and support for its range of SiC MOSFETs and Schottky diodes.

Ibérica will have access to SemiQ's complete portfolio of modules, discrete and bare-die products, and will provide these with application and design support to power system developers across the entire continent. Ibérica has a long-established position in the Spanish power electronics market and will lead the development of SemiQ's business in Spain, while supporting customers and opportunities across Europe.

Industrial and automotive systems are undergoing electrification to meet sustainability requirements, with data centers and other high-power sectors striving to become more energy efficient. At the same time renewable generation and storage is scaling rapidly to meet demand and reduce the impact of these sectors. As a result, the market for silicon carbide-based power electronics continues to grow rapidly.

SemiQ says its portfolio is noted for its ruggedness and reliability in demanding environments, and integrates seamlessly into Ibérica's focus on renewables, transport and industrial applications.

"Ibérica is a leading player in the European power space and will play a key role in expanding our reach and support within the region," says SemiQ's president Dr Timothy Han. "Their experience of working across the power electronics space is second to none, and this means our customers can benefit from exceptional support when implementing systems based on SemiQ's high-performance, high-reliability silicon carbide technologies," he adds.

"Silicon carbide's reliability and efficiency are essential if Europe is to continue to electrify its industrial and transport systems, as well as to roll out solar, wind and other renewable infrastructure to meet net-zero requirements," says Iberica's managing director Ignacio Salido de Miguel. "Adding SemiQ's MOSFETs and modules can only help our customers accelerate innovation in these vital high-power markets."

www.ibersp.com/es.
www.SemiQ.com

Qorvo's DARPA THREADS phase 1 work boosts GaN transistor X-band RF power density by 400%

Results precede follow-on work in Phase 2 of THREADS program

Qorvo Inc of Greensboro, NC, USA (which provides core technologies and RF solutions for mobile, infrastructure and defense applications) says that — in R&D work funded by the US Defense Advanced Research Projects Agency (DARPA) program Thermal Reduction for Electronics through Advanced Devices and Heterogeneous Semiconductors (THREADS) — it has achieved more than a 400% increase in the RF power density for a gallium nitride (GaN) transistor operating at X-band frequencies. This demonstrates the potential to deliver substantially higher RF power for next-generation radar, electronic warfare (EW) and communications systems.

As transistor output power increases, excess heat in the channel can reduce RF performance, shorten device lifetime and constrain the range and effectiveness of RF systems. Under the THREADS initiative for a paradigm shift, Qorvo is developing and integrating new materials, device architectures and processes to reduce the total thermal resistance within the device for transistor-level thermal management while substantially boosting RF performance.

"This achievement reflects the depth of Qorvo's expertise in GaN device design and thermal management," says Gangadhar Burra, senior director & chief architect in Qorvo's HPA business. "By addressing heat at the transistor level, we are opening a path to substantially higher RF output power without increasing system size or weight. That could enable longer-range radar, more effective electronic warfare and stronger communications with the reliability required for demanding defense applications."

Qorvo achieved this technology milestone at the end of THREADS Phase I, and has been awarded follow-on work in Phase 2 of the program.

Qorvo was selected in 2023 to participate in the four-year THREADS program, through which the firm is helping to advance the state of the art in high-power RF technology. Its work builds on decades of innovation in GaN technology and experience delivering RF solutions for radar, EW and communications applications. Qorvo says that it continues to advance GaN device and process technologies that help customers to increase RF performance while addressing demanding size, weight, power and reliability requirements.

www.darpa.mil
www.qorvo.com

Modelithics releases Qorvo GaN Library v26.5.11

New 200W GaN model validated against load-pull measurements across 2.5–3.5GHz

Modelithics Inc of Tampa, FL, USA, which provides RF and microwave simulation models for electronic design automation (EDA), has released the Modelithics Qorvo GaN Library v26.5.11. For more than 12 years, the Modelithics Qorvo GaN Library has provided RF and microwave engineers with up-to-date, highly accurate, measurement-based nonlinear models that accelerate design cycles, improve first-pass success and reduce development costs.

Developed and supported by Modelithics in close cooperation with Qorvo, the library includes nonlinear models for an extensive portfolio of Qorvo GaN die and packaged power transistor products, providing engineers with trusted models for the design and optimization of high-performance RF power amplifiers and related circuits. Each GaN model has advanced modeling features such as broadband validation, self-heating effects, temperature scalability, intrinsic I–V sensing and comprehensive model documentation.

The latest release adds a nonlinear model for the QPD2562L, a 200W GaN transistor, that is validated against load-pull measurements across multiple frequencies from 2.5GHz to 3.5GHz. Version 26.5.11 also expands compatibility for all GaN models in the library to include Keysight ADS 2027, while maintaining support for ADS 2024 through ADS 2026 and multiple versions of the Cadence AWR Design Environment.

For customers seeking a complete board-based power amplifier design solution, the Modelithics COMPLETE Library adds accurate, substrate-scalable and part-value-scalable passive component models for matching and bias networks. Customers using the Modelithics Qorvo GaN Library are encouraged to learn more about Modelithics COMPLETE Library, which provides seamless access to a broad portfolio of highly accurate passive as well as active and system component-level models. Together, these libraries enable designers to simulate entire RF and microwave circuits and modules with greater accuracy, helping to reduce design iterations and accelerate time to market.

www.modelithics.com/mvp/qorvo

Nexperia explores power semiconductor collaboration with Aurobay for electrified powertrains

Joint evaluation of GaN and SiC targets higher efficiency and more compact automotive power electronics

Discrete device designer and manufacturer Nexperia B.V. of Nijmegen, the Netherlands (which operates wafer fabs in Hamburg, Germany, and Hazel Grove Manchester, UK) says it will explore a strategic collaboration on advanced power semiconductor solutions for automotive applications with Aurobay Technologies, a division of Horse Powertrain Ltd (a joint venture between Renault Group and Geely). The collaboration aims to combine Nexperia's expertise in gallium nitride (GaN) and silicon carbide (SiC) with Aurobay's capabilities in powertrain system design and integration. Building on an existing collaboration, the firms aim to evaluate how closer cooperation across semiconductor development and powertrain integration can support the next generation of electrified and hybrid vehicle platforms.

The collaboration follows the deployment of Nexperia's GaN devices in Aurobay's highly integrated power generation system for range extender applications. The project demonstrated the potential of wide-bandgap semiconductor technologies to improve efficiency, reduce system size and weight, and enhance overall performance in demanding automotive environments.

Building on this foundation, Nexperia and Aurobay will assess opportunities to further optimize power electronics architectures for applications including traction inverters and power generation systems. By combining Nexperia's WBG expertise with Aurobay's experience and capabilities in powertrain systems, the companies intend to evaluate joint engineering approaches, including early-stage co-design and system-level optimization.

As vehicle manufacturers seek higher efficiency, greater power density and more compact powertrain architectures, wide-bandgap semiconductor technologies are becoming increasingly important enablers of electrification. Through this collaboration, Nexperia and Aurobay aim to explore new approaches that accelerate the adoption of advanced power semiconductor solutions and support the development of scalable, high-performance propulsion systems for future mobility.

"GaN and SiC technologies offer significant opportunities to improve efficiency, power density and system performance in automotive applications," says Edoardo Merli, head of business group Wide-Bandgap, IGBTs and Modules at Nexperia. "By working closely with Aurobay Technologies, we can better understand system-level requirements and evaluate how advanced semiconductor technologies can deliver measurable benefits at the vehicle level. We look forward to building on our successful collaboration and exploring new opportunities together," he adds.

"Our experience integrating Nexperia's GaN technology into a highly integrated power generation system demonstrated the potential of close collaboration across the value chain," says Dr Ma Yongquan, chief engineer, Advanced Engineering on Electrical Components at Aurobay. "By combining our expertise in powertrain systems with Nexperia's semiconductor innovation, we can evaluate new approaches to improving efficiency, performance and packaging for future electrified propulsion systems."

www.nexperia.com



EPC issues white papers on GaN power conversion for AI data centers and advanced motor drives

Papers examine 800VDC power delivery for AI infrastructure and integrated 100V GaN power stages for robotics, drones, and precision motion control

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 — has issued two new technical white papers addressing critical power conversion challenges in two rapidly evolving markets: AI data centers and high-performance multi-axis motor drives.

The first white paper 'GaN-Based Power Delivery in AI Data Centers: High-Density Power Conversion Architectures from 800VDC to Point-of-Load' examines the transition toward 800VDC distribution as AI racks move from tens of kilowatts toward hundreds of kilowatts and megawatt-scale compute clusters. At 800VDC, a 200kW rack requires only one-sixteenth of the current of a 48V distribution bus, reducing conductor size, I^2R losses, and cooling requirements.

The paper explores three architectures for converting 800VDC to 50V, 12.5V and 6.25V rails, with particular focus on modular input-series, output-parallel (ISOP) LLC converters. By dividing the high-voltage input among multiple modules, the architecture enables low-voltage GaN FETs with a better figure of merit, compared to higher-voltage devices, to perform high-ratio conversion at high switching frequencies.

Practical results demonstrate the performance potential: an 800V-to-50V implementation reaches 98.6% peak efficiency, while the EPC91123 800V-to-12.5V converter achieves 98.2% peak efficiency in an 8mm profile. A 6kW 800V-to-6.25V architecture reaches 98% peak and 97% full-load efficiency.

"As GPU power continues to increase, power conversion must move closer to the processor while minimizing conversion stages," says Jason Zhang, VP of DC–DC marketing and system engineering at EPC. "Gen 7 GaN combined with modular ISOP architectures provides a practical path from an 800VDC backbone to the very low bus voltages and extremely high currents required by next-generation AI processors."

The second white paper 'From Device to Platform: EPC23108/09/10/11 100V Integrated GaN Power Stages Simplify Multi-Axis Motor Drive Design' addresses the increasing complexity of motor drives used in humanoid robots, drones, surgical robotics, and precision motion systems.

The EPC231xx family integrates high- and low-side eGaN FETs, gate drive, level shifting, control interface, and protection functions into a monolithic GaN 100V ePower Stage IC. The accompanying EPC91128–EPC91131 three-phase BLDC/PMSM inverter platforms give engineers a complete environment to evaluate current capability, sensing, protection, thermal performance, and different PWM interfaces.

The platforms operate across a recommended 14–80V range (48V typical) and support switching frequencies from 20kHz to 150kHz. Complementary PWM versions maximize control flexibility, while single-PWM-input-pin versions reduce control-line count and wiring complexity — an increasingly important advantage as robotic systems scale to dozens of motors.

"In multi-axis robotics, power density is only part of the challenge," says Marco Palma, VP motor drive marketing and system engineering at EPC. "Integration must also simplify control, protection, sensing, thermal management, and wiring. The EPC231xx family and its evaluation platforms give engineers a validated starting point that can be replicated efficiently across many motor axes."

Together, the two white papers demonstrate how GaN is moving beyond component-level performance to enable complete power architectures - from multi-kilowatt AI infrastructure to compact, highly integrated motor drives.

Available in English and Chinese, the white papers can be downloaded via the links below:

- WP019 — From Device to Platform: EPC23108/109/110/11 100 V Integrated GaN Power Stages Simplify Multi-Axis Motor Drive Design;
- WP020 — GaN-Based Power Delivery in AI Data Centers: High-Density Power Conversion Architectures from 800VDC to Point-of-Load.

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Eggtronic introduces high-efficiency 140W USB-C Power Delivery reference design

EPIC digital power architecture combined with Renesas high-voltage GaN transistors

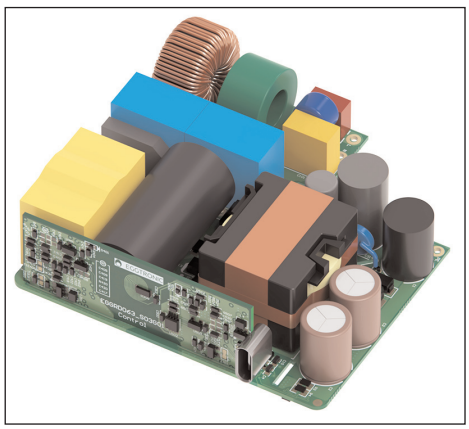
Eggtronic of Modena, Italy (which provides mixed-signal IC controllers for power electronics) has announced the availability of a 140W USB-C Power Delivery AC/DC reference platform for next-generation premium laptops and high-performance devices. This reference design is developed based on Renesas' high-voltage GaN transistors.

The new platform combines Eggtronic's EPIC combo controller with Renesas' high-voltage GaN device, the TP70H150G4LSG (700V, 150mΩ $R_{DS(on)}$), delivering what is claimed to be an unprecedented combination of extreme efficiency, outstanding cost-effectiveness, and simplified system architecture.

Unlike conventional high-power USB-C adapters that rely on costly LLC, asymmetrical half-bridge (AHB), or active clamp flyback (ACF) topologies, the new reference design achieves efficiencies approaching 96% while maintaining the bill-of-materials cost of a traditional QR flyback converter.

The platform is also said to deliver excellent efficiency across the entire operating range, including 94.5% efficiency at 90VAC input and outstanding light-load performance, enabling compliance with the latest DOE Level VII energy-efficiency requirements.

Eggtronic's EPIC combo controller integrates major control functions



into a single device, including:

- totem-pole power factor correction (PFC);
- isolated primary-side regulation;
- synchronous rectification;
- proprietary ultra-low-latency isolated communication; and
- USB Power Delivery protocol management.

The platform's totem-pole PFC overcomes two of the most common limitations of conventional implementations — EMI performance and light-load efficiency — while maintaining what is claimed to be industry-leading conversion efficiency.

The PFC stage feeds Eggtronic's proprietary QuarEgg regenerative flyback architecture, which utilizes a single primary-side switch to achieve higher efficiency and lower system cost than LLC, AHB and ACF converters while maintaining the simplicity and economics of a QR flyback design.

"The demand for compact, cost-effective, highly efficient USB-C power adapters continues to grow rapidly," says Eggtronic's founder & CEO Igor Spinella. "By combining Renesas' outstanding GaN technology with our EPIC combo-controller, we have created a platform that significantly raises the bar for both efficiency and cost-effectiveness. We believe this reference design provides OEMs with a compelling path toward the next generation of premium power adapters," he adds.

"Renesas is committed to enabling the next generation of highly efficient and cost-effective power solutions through our advanced GaN technology," says Rohan Samsi, VP of Renesas' GaN business division. "The reference platform is a direct result of our collaboration with Eggtronic, which brings together complementary expertise in power conversion and digital control. It gives customers a strong foundation for developing compact, high-performance power systems such as USB-C charging at a competitive cost."

The 140W USB-C Power Delivery reference board is available now and is intended to accelerate the development of high-performance notebook adapters and other USB-C powered devices.

www.eggtronic.com/product/140w-usb-c-pd-3-1-totem-pole-pfc-regenerative-zvs-flyback-converter

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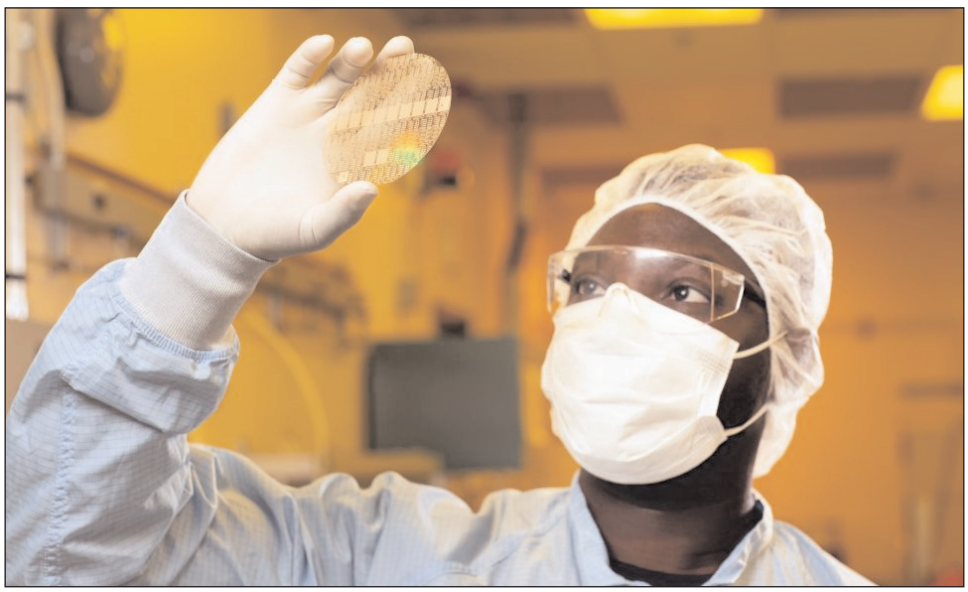
Northrop Grumman wins $7m DARPA contract to create diamond-cooled chips

Better heat dissipation enables smaller, lighter, faster and longer-lasting defense and space equipment

US-based aerospace & defense technology company Northrop Grumman Corp has won a $7m contract to create diamond-cooled chips that deliver higher power, faster speeds and enhanced performance for military radar and communications. The award marks Phase 2 of the US Defense Advanced Research Projects Agency's (DARPA) program Technologies for Heat Removal in Electronics at the Device Scale (THREADS), which aims to integrate diamond-based heat-dissipation technology into next-generation semiconductors for defense-grade chips:

- Heat threatens modern RF electronics. Currently, RF systems operate well below their limits to prevent overheating, which reduces power, shortens chip life and increases the risk of circuit failure in demanding missions.
- Diamonds extract heat better than any other material. Diamond conducts heat five times faster than copper and far outperforms silicon carbide and gallium nitride, which are currently used for high-performance applications. A diamond-cooled chip spreads heat more efficiently, letting it run longer without overheating.
- Power density could jump tenfold. Power density is vital for next-generation electronics. In DARPA THREADS Phase 1, Northrop Grumman boosted power by 3.3x; Phase 2 will push it further, delivering far stronger RF transmitters for military communications and satellite links.

"Temperature has long capped what microelectronics can do, even gallium nitride (GaN), which is a standard today," says Ben Heying, director of microelectronics at Northrop Grumman's Space Park Foundry. "Embedding diamond directly into chips works like a turbocharged cooling system. It keeps the chips cool, so we can crank up the power without risk of burnout," he adds. "This breakthrough lets Northrop Grumman's diamond-cooled chips push beyond traditional heat limits and unlocks a new generation of fast, reliable RF electronics."



Northrop Grumman engineers manufacture new microchips cooled with diamond to help defense and commercial systems run faster and last longer. (Photo courtesy of Northrop Grumman).

At the company's Microelectronics Center in Redondo Beach, CA, USA, microscopic diamonds are added directly into chips, removing heat from radio frequency (RF) circuits. Northrop Grumman recently completed successful high-power tests using diamond as a semiconductor material. This breakthrough keeps the devices cooler, boosts their speed and reliability, and allows them to handle higher power levels without throttling, ultimately delivering faster, more dependable performance for critical military systems.

Drawing on the firm's open access business model, Northrop Grumman partnered with Stanford University to embed diamond by growing a layer on the backside of the device within its microscopic channels. The diamond-filled channels transfer heat away from hotspots, keeping the device cool even at maximum power.

In Phase 2, Northrop Grumman plans to make these diamond-enhanced chips over three times more powerful, delivering more capability while taking up less space. This will unlock far stronger RF transmitters, enhancing military communications, next-generation satellite links, and a broad spectrum of future applications.

The Phase 2 goal — tripling power density once again — is the outcome of Northrop Grumman's diamond technology research and investment, started in 2019. By capitalizing on diamond's unrivaled heat conductivity and its ability to endure extreme temperatures, the firm says that it is exploiting it to pave the way for the next generation of high-power, mission-critical semiconductors.

www.darpa.mil/research/programs/threads-heat-removal

UK's Battalion and Penn State launch research collaboration focused on national security

Project to integrate GaN and related wide-bandgap and ultrawide-bandgap semiconductors on substrates with improved thermal and electrical performance.

The USA's Penn State University and UK-based Battalion Advanced Technology Ltd have entered into two research agreements worth up to $6m to develop advanced semiconductor platforms and high-temperature materials that aim to enable next-generation energy, transportation, aerospace and industrial systems while also providing critical capabilities for national security.

Led by researchers at Penn State's Materials Research Institute (MRI), the projects bring together researchers from across the university to address two major materials challenges in technologies that operate under extreme conditions: integrating advanced semiconductors with high-performance substrates that can withstand the conditions and dissipate heat, as well as developing durable, oxidation-resistant alloys that can withstand extreme-temperature environments including hypersonic flight.

London-based Battalion Advanced Technology, which is focused on advancing next-generation materials for dual-use applications, will provide up to $1m per year for each project. The agreements went into effect on 16 July and will run for three years.

"Penn State Materials brings together expertise in semiconductor science, computation, manufacturing and characterization," says the MRI's director Joshua A. Robinson, professor of materials science and engineering. "This collaboration allows us to apply that breadth to two complex materials challenges with direct implications for US technological leadership and national security," he adds.

"Pennsylvania has the talent, research institutions, and innovative spirit to help America lead in the technologies that will define our economic and national security," comments US Senator Dave McCormick. "This research collaboration, backed by up to $6m from Battalion Advanced Technology, will help Penn State advance critical work in semiconductors, aerospace, defense, and other strategic industries while strengthening Pennsylvania's role as a hub for American innovation."

Semiconductor project details

The semiconductor project is led by Joan Redwing, distinguished professor of materials science and engineering and of electrical engineering. Her team will explore new ways to integrate gallium nitride and related wide-bandgap and ultrawide-bandgap semiconductors with substrates that offer improved thermal and electrical performance.

The researchers will investigate whether atomically thin interlayers — materials designed to improve how different materials connect and perform together — can help gallium nitride semiconductors integrate more effectively with materials such as diamond and aluminium nitride, relieve stress where the materials meet and reduce defects during semiconductor growth.

The work will combine materials synthesis and characterization, with the goal of moving beyond conventional approaches for growing crystalline layers. The collaboration draws on the university's interdisciplinary materials research community, as well as specialized facilities and technical capabilities available through the MRI and other university research units.

"By using atomically thin two-dimensional materials as interlayers, we aim to minimize crystalline defects and interfacial thermal resistance while enabling wide-bandgap semiconductor growth on high thermal conductivity substrates that have traditionally been incompatible with direct deposition," Redwing says.

The co-principal investigators on the semiconductor project include Robinson; Adrianus van Duin, distinguished professor of mechanical engineering; and Chen Chen, assistant research professor in MRI.

www.mri.psu.edu
www.battaliontech.com

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IVWorks strengthens GaN epi with AI-driven production system upgrade

Firm targets 89% equipment utilization with data, AI and automation

IVWorks Co Ltd of Daejeon, South Korea — which was founded in 2011 and manufactures 100–200mm gallium nitride (GaN) epitaxial wafers for RF & power electronics applications — is accelerating the shift from automated production that follows fixed procedures to an autonomous process in which AI judges the existing state and decides the next action on its own. The shift is based on the company's in-house AI epitaxy platform DOMM, which is used in its GaN epiwafer production.

GaN epitaxy requires precise control of multiple process conditions to keep crystal growth stable, making it essential to continuously monitor and respond to even small changes during production. To address this, IVWorks has collected reflection high-energy electron diffraction (RHEED) data from its molecular beam epitaxy (MBE) process together with time-series data such as equipment temperature and pressure since 2019. To date, the company has accumulated more than 330 million time-series data points and over 30TB of RHEED data.

The accumulated data is also used in the actual mass-production process. AI models analyze RHEED and equipment data to assess growth conditions and determine whether there are any abnormalities, while the automation framework MRA (MBE Run Automation) is responsible for carrying out the actual process, from wafer loading and growth to unloading. Although the two systems have different roles, by working together, IVWorks has been able to gradually reduce human intervention and build a foundation for improving production stability.



In the AI-driven automated production process, an engineer remotely monitors equipment operation and thin-film growth in real time from the control room.

Building on this experience, IVWorks is advancing its manufacturing system to use data not just for after-the-fact quality checks, but to monitor process conditions and guide production in real time. As a next step, the company plans to develop AI agents that combine equipment status, production history and quality data to recommend maintenance timing and production plans on their own, enabling uninterrupted production even at night and on weekends. The goal is to raise both quality and productivity, strengthening IVWorks' competitiveness in GaN epitaxy production.

Through this effort, IVWorks aims to raise equipment uptime from about 84% to 89%, while streamlining staffing from about two operators per machine to 1.5.

In recognition of this in-house technology capability, IVWorks was recently selected to take part in a program run by South Korea's Ministry of SMEs and Startups to build AI-specialized smart factories. Through the program, the company plans to further expand the use of its accumulated manufacturing data and AI-based automation across its production environment.

"GaN epitaxial wafers are a key material for next-generation semiconductors, including 5G and 6G communications, AESA radar, and optical interconnects," says chief information officer (CIO) Hongkyun Noh. "As mass production of GaN epitaxial wafers begins in earnest, combining data-driven autonomous processes will be essential to securing competitiveness in quality, delivery, and cost simultaneously."

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US Department of War investing $174m in Alcoa's alumina refinery in Western Australia

US securing gallium supply for defense industrial base

The US Department of War (DOW) has announced an estimated $174m equity financing investment to construct a new gallium production facility at Alcoa's Wagerup alumina refinery in Western Australia. Executed by the Office of the Assistant Secretary of War for Industrial Base Policy (OASW(IBP)) via the Industrial Base Analysis and Sustainment (IBAS) program, the initiative is a multi-national partnership with Export Finance Australia (EFA), the Government of Japan, and Sojitz Corp. Alcoa of Australia will operate the facility, which is projected to produce 100 metric tons of gallium metal annually.

"This landmark agreement with our key allies, Australia and Japan, will secure a vital supply of gallium for our defense industrial base, strengthening our collective security and economic resilience for years to come," says the Honorable Michael Cadenazzi, Assistant Secretary of War for Industrial Base Policy.

Gallium is essential to high-performance semiconductors underpinning critical defense capabilities including advanced radars for aerial and maritime platforms, ground-based missile defense systems, secure satellite and tactical communications, and precision electro-optical/infrared sensors for missile guidance and thermal imaging. Gallium is also critical for solar cells powering military and civilian satellites. Securing a reliable supply of gallium is essential for the DOW, and the project aims to build long-term resilience in the existing global supply chain.

www.alcoa.com
www.war.gov

Ground broken on Alcoa-Sojitz Gallium Recovery Project in Western Australia

Facility expected to produce up to 10% of global gallium supply

In what is described as a milestone for Australia's international supply chain security, ground has been broken on the Alcoa-Sojitz Gallium Recovery Project in Western Australia.

The project, at the Wagerup Alumina Refinery of Alcoa Corp (which provides bauxite, alumina and aluminium products), is expected to help establish Australia as a significant global producer of gallium.

The project represents an important investment between the governments of Australia, Japan and the USA, with support from the Western Australian Government, says Madeleine King, Minister for Resources and Northern Australia. "This is a real example of how Australia, together with trusted partners, is stepping up to lead on critical minerals and rare earths globally," she adds.

"Investments like the Alcoa-Sojitz Gallium Recovery Project are about building Australia's industrial strength," says Tim Ayres, Industry and Innovation and Minister for Science. "By partnering with trusted allies and investing in capability here at home, we're creating a more resilient economy and securing Australia's place in the industries of the future."

Once fully operational, the Alcoa facility is expected to produce up to 10% of the world's gallium supply, making a substantial contribution to global demand and strengthening supply security for international partners.

www.industry.gov.au
www.alcoa.com

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ATALCO reaches $800m in funding for alumina refinery

New $350m equity stake to enable production of the USA's first primary gallium

Atlantic Alumina Company LLC (ATALCO, the only operating alumina refinery in the USA) has expanded its partnership with the US Department of War's (DoW) Office of the Under Secretary of War for Acquisition & Sustainment, the Economic Defense Unit, and natural resource company Concord Resources Holdings Ltd (ATALCO's majority owner), in conjunction with Concord's majority shareholder (a fund managed by New York-based commodities investment firm Pinnacle Asset Management L.P). The new funding, in the form of $350m in preferred equity, brings total capital raised for the ATALCO facility in Gramercy, Louisiana and its critical mineral production to $800m since the start of the year, split evenly between $400m from the DoW and $400m from private investors through Pinnacle's fund.

Commissioned in 1959, ATALCO's Gramercy facility is the only US producer of smelter-grade alumina, the essential raw material for aluminium metal required in the aerospace, defense and automotive sectors. The firm also produces chemical-grade alumina used for important industrial operations, including in catalysts for oil and gas refineries, refractories, fire suppressants, ceramic casings for semiconductors, and municipal water treatment. Notably, the State of Louisiana under Governor Jeff Landry recently announced an executive order prioritizing the production of alumina and gallium, which have been designated critical minerals by the US Government.

Building on the initial investment announced in January, ATALCO has significantly expanded its alumina production capabilities and constructed a pilot primary gallium production facility at its Gramercy refinery, which is now undergoing testing. This Fall, the firm expects to deliver the USA's first domestic primary production of gallium, recovered simultaneously with alumina during the refining process.

This public–private partnership funds the revitalization of the Gramercy facility's operations, securing ATALCO's ability to provide the USA with the alumina needed for industrial supply chains across the country and supporting over 500 jobs. Building on the pilot facility now nearing first production, the firm expects to produce up to 50 metric tons of gallium per year at the Gramercy facility. To advance critical mineral independence in the USA, ATALCO will also begin R&D on the processing of other critical minerals recovered from its bauxite residue.

"We are pleased to secure the domestic supply chain for alumina and gallium, building America's critical mineral resilience in commodity markets that have historically been dominated by China," says ATALCO. "With $800m of combined public and private capital behind this facility, we are on a clear path to supplying America's aluminium smelters as well as producers of aerospace and defense systems with the alumina and gallium needed to move the country forward," it adds.

Through joint public and private investment, ATALCO has raised $800m to support the revitalization of the facility's production circuit, with $400m from the DoW and $400m from private investors. This includes the $450m partnership previously announced in January and an additional $350m of capital committed since then.

"Investing in American critical minerals and commodities is at the center of our investment thesis," says Jason Kellman, chief investment officer at Pinnacle Asset Management. "ATALCO's ability to meet the needs of US industries with a reliable supply of alumina as well as the only domestically produced primary gallium demonstrates the impact of public–private collaboration in securing industrial supply chains," he adds.

"With many of the country's most important industries reliant on alumina and gallium — including defense, aerospace, and energy — this investment will have a meaningful impact on America's critical mineral independence and defense industrial base," believes Pinnacle's managing partner Scott Kellman.

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5N+ to expand production facility in Utah by 50%

Construction to begin in Q3/2026 and complete by second-half 2027

Specialty semiconductor and performance materials producer 5N Plus Inc (5N+) of Montréal, Québec, Canada plans to expand its US facility in St. George, Utah by about 50%. The expansion project aims to provide a capital-efficient and scalable platform to grow 5N+'s advanced materials capabilities for defence, space solar, medical imaging and industrial sensing applications. It will also contribute to strengthening the resilience of strategic North American critical mineral transformation supply chains.

The additional manufacturing and product-development space will improve site workflows and install new equipment, allowing 5N+ to progressively grow its team of engineers and materials scientists, and increase production capacity. While construction is ongoing, 5N+ engineers, technicians and third-party equipment manufacturers will assemble critical equipment offsite, to accelerate installation once construction is complete and capacity ramp-up. Construction is expected to begin in third-quarter 2026 and to be completed by second-half 2027.

"5N+ has deep expertise transforming critical minerals and, over the past several years, our St George team has solidified its position as a trusted partner in strategic US and global supply chains," says 5N+'s president & CEO Richard Perron. "The customer relationships we have built across government and industry, combined with deliberate investments in our talent and technology, have positioned St. George for further growth, including within the US defence industrial base," he adds.

"Expanding our existing St George facility will create a capital-efficient and scalable platform to increase our capacity in step with customer demand, leveraging the site's established operations, experienced team and technical expertise. Our project execution plan will also accelerate time to market for customer-backed opportunities, while having an expanded facility will provide flexibility to support additional growth over time across our core end markets."

The expansion project follows two recently announced US government awards supporting capabilities being developed in St. George over the coming years, as well as partnerships with US defence customers.

The St. George facility, wholly owned by 5N+ since 2014, transforms germanium, indium antimonide, gallium arsenide, cadmium telluride and cadmium zinc telluride into high-value semiconductor materials, wafers, substrates and selected components. Applications range from infrared optics and defence electro-optical systems to space solar power and medical CT scanners. The team supports established customer applications while working closely with customers and partners to develop and qualify new materials and products for emerging and next-generation uses. Its integrated capabilities span material recovery, refining and purification, along with semiconductor crystal growth, precision cutting and polishing, and specialized product and process development. The breadth and integration of these capabilities support long-term customer relationships in markets with demanding qualification and performance requirements.

The St. George expansion project, including the gradual installation of new equipment, will be funded within the firm's existing capital expenditure plans and support from customers.

www.5nplus.com

AXT agrees long-term InP supply deal with Lumentum

Initial deposit of $43.5m within 30 business days, followed by second $43.5m deposit during 2028

AXT Inc of Fremont, CA, USA — which makes gallium arsenide (GaAs), indium phosphide (InP) and germanium (Ge) substrates and raw materials at plants in China — has entered into a definitive agreement with Lumentum Operations LLC of San Jose, CA, USA (which designs and makes photonic products for optical networks and lasers for industrial and consumer markets) for the supply and capacity reservation of indium phosphide wafer substrates.

AXT has agreed to reserve a minimum annual commitment of indium phosphide by Lumentum for a period beginning upon entry into the agreement, running through 31 December 2031, and to support any additional capacity that may be required.

In consideration for the reservation of the product capacity, Lumentum has agreed to pay AXT an initial deposit of $43.5m, due within 30 business days after entry into the agreement, and a second deposit of $43.5m, with the timing and terms surrounding payment to be subsequently determined during calendar year 2028.

The deposits shall be applied as shipment credits towards the purchase of the products, until such deposit is exhausted.

www.lumentum.com
www.axt.com

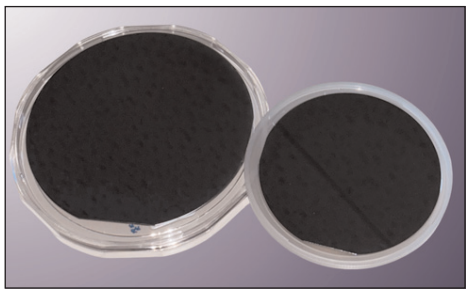
Sumitomo Chemical begins mass production of 4-inch InP epiwafers

Sales targeted at AI data center and high-speed network applications

Japan-based Sumitomo Chemical Co Ltd has established mass production of 4-inch indium phosphide (InP) epitaxial wafers at its Ibaraki Works in Hitachi, Ibaraki Prefecture, and has begun selling the new products.

The firm says that, as one of the few epi houses in Japan capable of stably mass producing InP epiwafers, it targets sales of about ¥10bn from this product by the mid-2030s.

With the widespread adoption of generative AI, along with the expansion of IoT and cloud services, and the enhancement of communication network infrastructure, there is growing demand for data processing that is faster and capable of handling larger volumes of data across a wide range of fields, notes Sumitomo Chemical. For AI data centers in particular, power consumption and information processing loads have become major global challenges. Photonic–electronic convergence technologies are attracting attention as a key solution. Among these



technologies, InP epiwafers are seeing rapidly increasing use in next-generation data centers and high-speed networks as a core material for enabling high-performance optoelectronic devices. Demand for InP epiwafers is expected to grow significantly in the future.

InP epiwafer manufacturing requires advanced technologies to precisely control material composition and surface conditions in the epitaxial growth process under high temperature. In addition, sophisticated process management is necessary throughout the entire manufacturing process, including the handling of raw material gases, in order to achieve both stable operations and quality assurance.

Sumitomo Chemical says that, to address these challenges, it has brought together its proprietary composition control, thin-film stacking, and crystal growth process control technologies cultivated through more than 25 years of mass-producing gallium arsenide (GaAs) and gallium nitride (GaN) epiwafers. These technologies have enabled the firm to establish a mass-production system for InP epiwafers that is said to combine high quality with high productivity.

Sumitomo Chemical is positioning its ICT & Mobility Solutions business as a growth driver and is focusing on semiconductor-related businesses as a priority area. Going forward, the firm will add InP epiwafers to its lineup of compound semiconductor materials, which includes GaN substrates, GaN epiwafers and GaAs epiwafers, as it aims to further expand its business into growth markets, such as wireless communications, power semiconductors, and data centers.

www.sumitomo-chem.co.jp/sciocs

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Besxar completes inaugural flight with SpaceX

Semi-permeable canister maintained clean environmental conditions from launch to landing

Reporting the results of its Flight-1 'Mission Asimov', Washington DC-based Besxar (which is developing the manufacturing of advanced semiconductor materials in space) says that, on 5 July, two of its 'Clipper-class' canisters flew from Space Launch Complex 40 (SLC-40) at Cape Canaveral Space Force Station in Florida aboard a SpaceX Falcon 9 first-stage booster and were recovered intact after the booster returned to land.

Besxar's reusable Fabships reached about 71 miles in altitude (past the internationally recognized edge of space) and the mission concluded about 11 minutes after liftoff.

It was the first flight carrying custom wafer cartridges, power, avionics, and printed-circuit hardware that Besxar designed and built in-house, all of which qualified on the first attempt.

The mission carried gallium nitride (GaN)-on-sapphire, undoped silicon, and bare sapphire wafer samples from Besxar, in addition to gallium arsenide (GaAs), and aluminum indium arsenide antimonide (AlInAsSb) wafers from academic research partners at the University of Virginia (UVA) and the University of Texas at Austin (UT Austin).

Flight outcomes

Besxar's primary test objective for Flight-1 was the viability and performance of the canister design in admitting vacuum, i.e. does it work as a cleanroom? The canister needed to:

(1) maintain structural integrity through all phases of flight, re-entry, and recovery;

(2) allow vacuum into the canister during flight to expose test materials; and

(3) prevent contaminants from entering the canister. Post-flight testing indicates that Besxar's canisters performed as expected.

Besxar also tested the canister design's ability to carry wafers safely



through the entire flight profile. The canisters flew multiple wafer samples of varying compound semiconductor materials, and initial analysis indicates that none sustained damage. Besxar engineers examined the wafers and canister interiors against pre-flight markers and found no cracking, no warping, and no visible damage. Substrates flown for UVA and UT Austin are currently undergoing independent analysis at the material level that may yield additional data on the effects of vacuum exposure on compound semiconductor materials and their manufacturability.

Besxar's ultimate in-space manufacturing process will be fully autonomous, which requires significant real-time data and testing infrastructure. The firm built the initial foundation of that data collection system for Flight-1 and will expand it across subsequent flights and, eventually, operations. The data system performed well. Besxar was able to collect pressure, acceleration, thermal, vibration and shock data for the entire mission. One canister performed nominally; the second canister had an anomaly when recording flight data. Besxar is completing its anomaly review and close-out ahead of the next flight.

"In just nine months, we've been able to design and test initial key capabilities for our in-space compound semiconductor wafer manufacturing technology," says founder & CEO Ashley Pilipiszyn. "We proved that the hardware is viable and that our systems can survive the extreme swings of spaceflight. Now, we have real data and, more importantly, a team with payload integration, spaceflight, and recovery heritage that will only accelerate our work as we take on the next set of technical milestones on our roadmap."

Mission plans

Flight-1 was the first of 12 contracted missions under Besxar's launch agreement with SpaceX. Mission Asimov clears the way for the next set of key technical milestones toward in-space compound semiconductor manufacturing. Besxar says that it will apply what it learned and iterate quickly toward Flight-2.

Mission Asimov and future flights are financed by Besxar's early investors. Ahead of the mission, the firm raised a $10.3m seed round led by Dauntless Ventures alongside Overture VC, Keymaker VC, 645 Ventures, Singh Capital Partners, Koru Capital, Plum Alley Ventures, Mana Ventures and Earthrise VC, bringing total funding to $14.7m.

www.besxar.com

CVD Equipment no longer pursuing new system orders

Firm halves workforce as it transitions to spare parts, quartz and services business

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 announced a restructuring plan and leadership transition, following a thorough evaluation of strategic alternatives for its CVD equipment business by its board of directors. The restructuring plan includes the following:

- The company will no longer pursue new system orders for its CVD equipment business.
- The firm is further reducing its workforce by about half, to a level necessary to manufacture its remaining equipment backlog, satisfy warranty obligations, and support its ongoing spare parts, quartz, and services business.
- CVD hence expects to record a restructuring charge of $0.8-1m this quarter, consisting primarily of employee severance and related costs.
- Effective 3 September, and in conjunction with these actions, the board and Emmanuel Lakios have mutually agreed that he would conclude his employment as president & CEO and no longer serve as a member of the board. The board has appointed Warren Cheesman, VP of manufacturing operations, as acting CEO. "His knowledge of the company and operational experience will be valuable through this restructuring and continued evaluation of business alternatives," comments chairman Lawrence J. Waldman.
- The board continues to evaluate additional opportunities to reduce costs, monetize assets, and enhance shareholder value, including potential alternatives involving its real-estate assets, including its primary facility in Central Islip. It will also evaluate business opportunities that are consistent with its available resources and strategic objectives to enhance shareholder value.

"In light of continued weakness in prospective equipment order activity, declining backlog, the CVD equipment division's ongoing operating losses, and the lack of viable strategic alternatives for the business, we have decided to discontinue the pursuit of new equipment system orders, transitioning CVD to a spare parts, quartz and services business," says Waldman. "While unfortunately these actions impact our employees, they are designed to align the company's cost structure with current market conditions and opportunities, reduce operating risk, and preserve liquidity. At the end of the second quarter of 2026, the company had $23.5m in cash and no debt. Our top priority will be to complete existing customer commitments while we continue to pursue additional opportunities to maximize shareholder value," he adds.

"As we transition to this new phase for CVD, we'll focus on disciplined execution, prudent management of the company's assets and financial resources and, most importantly, fulfilling our important existing commitments to customers," says Cheesman.

Cheesman has been VP of manufacturing operations since October 2022. He has more than 30 years of experience in engineering, operations, quality, and strategic sourcing across the semiconductor, medical device, and defense equipment industries. Before joining CVD, he held positions of increasing responsibility at Veeco Instruments, Air Techniques, and Kongsberg Defense & Aerospace. Cheesman has master's degrees in Technology Management and Materials Science and Engineering from Stony Brook University and a bachelor's degree in Mechanical Engineering from Virginia Tech.

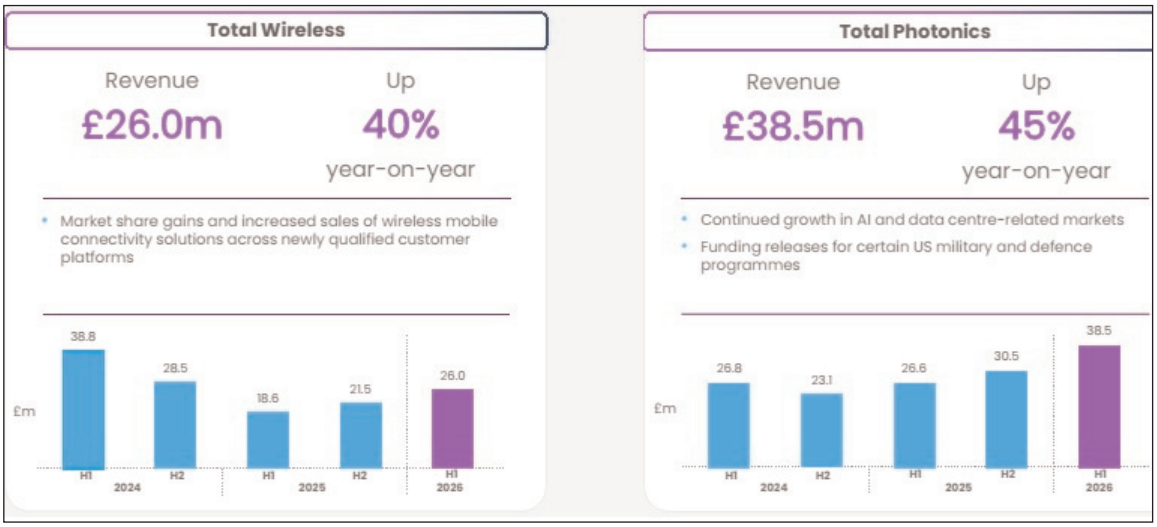
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IQE first-half 2026 revenue up 43% year-on-year, driven by AI data-center infrastructure, advanced sensing, wireless and defence

Tooling to be converted to increase InP capacity in second-half 2026

Epiwafer and substrate maker IQE plc of Cardiff, Wales, UK has reported greater-than-expected revenue of £64.6m for first-half 2026, up 43% from £45.3m in first-half 2025, supported by strong demand across all core segments.



Wireless revenue grew by 40% from £18.6m to £26m, reflecting market share gains and increased sales of wireless mobile connectivity solutions across newly qualified customer platforms.

Photonics revenue grew by 45% from £26.6m to £38.5m, driven by a combination of funding releases for certain US military and defence programs plus continued growth in AI- and data-center-related markets.

Growth across core markets is driving profitability. "This reflects the strong momentum we are seeing across AI-driven data-center infrastructure, advanced sensing, wireless and defence applications, alongside improved operational execution and a more favourable product mix," says CEO Jutta Meier. "We have demonstrated our ability to capture long-term growth opportunities across these critical markets, underpinned by a number of key supply agreements," she adds. Change in the customer engagement model has led to a high volume of supply agreements being signed since the conclusion of the firm's strategic review, providing strong future order visibility and optimized utilization.

Together with a more favourable product mix resulting from a higher proportion of Photonics sales, gross margin expansion was driven by increased utilization of manufacturing assets and capacity across the group.

Reflecting the combination of a higher revenue base and improved gross margins, adjusted EBITDA was £6m in first-half 2026, compared with first-half 2025's –£0.4m.

Net cash flow from operations has fallen from £3.6m to £1.2m, as a result of increased revenue and adjusted EBITDA, partially offset by a working capital outflow of £4m and restructuring and strategic review costs of £2.4m.

Cash capital expenditure (PP&E) was £1.1m (roughly level with first-half 2025's £1m), reflecting a continued prudent approach to capital expenditure, says the firm.

Following the conclusion of the firm's strategic review and receipt of the proceeds of fundraising a strategic investment from customer MACOM Technology Solutions Inc of Lowell, MA, USA and other existing shareholders, total cash and cash equivalents were £41.6m at end-June 2026, up from £17m at end-June 2025. Adjusted net cash was £30.2m at end-June 2026, compared with adjusted net debt of £23.5m at end-June 2025.

Market update

IQE lists the following developments during first-half 2026 in its key markets:

- ***AI and data centers***

— Strong indium phosphide (InP) demand is driving volume growth, complemented by qualifications in gallium arsenide (GaAs)-based new optical interconnect technologies for AI and data-center markets.

— Development and sampling of gallium nitride on silicon (GaN-on-Si) micro-LED epitaxy with partners serving hyperscalers for high-bandwidth, energy-efficient data transfer in AI data centers.

— Qualification of GaN-on-Si power epitaxy for use in high-efficiency AI and data-center power supply units.

- ***Consumer electronics***

— Launch of next-generation 3D sensing VCSEL technologies for future premium consumer devices, enabling enhanced sensing capabilities and supporting new smartphone form factors.

— Continued strong progress in multiple micro-LED epitaxy programs, achieving key development milestones and supporting future customer qualification activities for augmented reality and next-generation display applications.

— Advancing programs for wearable sensing applications through collaboration with ecosystem partners, supporting progression from

technology development towards future production opportunities.

● ***Aerospace and defence***

— Continued expansion of the GaN RF pipeline through new product qualifications and design-in activity across terrestrial, satellite including low Earth orbit (LEO), and defence radar platforms.

— Expanded IQE's global infrared customer base by securing multiple production orders and qualification opportunities across new geographies.

● ***Communications infrastructure***

— Strong progress with GaN-on-SiC qualifications for mobile base-station infrastructure serving high-frequency and high-power RF networks.

— Diversification of HBT technology into high-frequency consumer connectivity applications, including WiFi 7.

● ***Automotive and industrial***

— Achieved qualification and full-rate production of long-wavelength infrared and dual-band products for multiple tier-1 customers, supporting growth in autonomous vehicles, defence and advanced sensing applications.

— Actively expanding our US-based foundry partner ecosystem, broadening our geographic reach and securing global supply chains for 100V and 650V technology nodes.

Existing capacity to be converted to meet increased InP demand

Following July's trading update and upgraded full-year 2026 guidance — raising its forecast for revenue growth from more than 20% to over 30%, resulting in low-teens £m adjusted EBITDA — IQE says that it has continued to see strong momentum in second-half 2026, which is expected to support growth through the remainder of 2026 and beyond.

IQE also sees potential for upside opportunities in optical communications for data-center and AI infrastructure, underpinned by recently signed supply agreements. Existing tooling is hence to be converted to increase indium phosphide capacity in second-half 2026.

Operational highlights

IQE says that it continues to prioritize efficiency and operational excellence, and is already seeing improvements in yield and production outputs across its sites. To drive further progress and strengthen operational oversight, Matthew Geen was appointed as chief operating officer.

Move to Main Market

IQE says that it intends to apply for its ordinary shares to be admitted to trading on the Main Market of the London Stock Exchange. The board expects the move to enhance the firm's investor profile, broaden access to institutional capital, improve liquidity in its shares and support inclusion in FTSE indices. IQE is targeting admission in first-half 2027.

www.iqep.com

IQE announces purchase agreement with Quintessent as QD laser technology moves to customer sampling

IQE to supply 6-inch GaAs epiwafers through foundry-ready service

IQE has announced a purchase agreement with Quintessent Inc of Santa Barbara, CA, USA — which specializes in heterogeneous integration of quantum dot lasers and silicon photonic integrated circuits (PICs) — for the supply of quantum dot laser (QDL) epitaxy.

Following an initial strategic announcement and purchase order in January 2025, the extension of the companies' long-standing relationship will see IQE supply 6-inch gallium arsenide (GaAs) epiwafers through its foundry-ready service. This will support Quintessent's customer sampling activity as its technology progresses towards commercial deployment and new production introductions.

Quintessent's QDL product architecture enables the next generation of AI data-center infrastructure by meeting the need for optical interconnects with lower power consumption, simpler manufacturing and improved reliability compared to traditional laser technologies.

IQE and Quintessent have been working together for over a decade to transition QDL technology from research to large-scale production and previously announced a partnership to establish the world's first large-scale QDL epitaxial wafer supply chain.

"After a period of successful development, we are pleased to be enabling customer sampling with our partner Quintessent as its quantum dot laser technology moves towards broader market adoption and commercialization," says IQE's CEO Jutta Meier. "IQE's proven expertise in advanced epitaxy and high-volume manufacturing means we are ideally positioned to support the scaling of multiple complementary optical interconnect technologies that are enabling the AI revolution," she adds.

"Quintessent is an innovator in resilient AI data-center optical interconnect products that drive TCO [total cost of ownership] benefits for customers," says Quintessent's CEO & co-founder Alan Liu. "The next phase of the AI infrastructure buildout will require deep technology and supply chain partnerships to address the scale required in the AI ecosystem," he adds. "IQE has been a wonderful production partner, helping Quintessent enable our laser and SOA [semiconductor optical amplifier] technology. We look forward to continued collaboration with IQE."

www.quintessent.com

www.iqep.com

Riber's first-half revenue grows 19% year-on-year

Growth returns firm to profitability

Molecular beam epitaxy (MBE) system maker Riber S.A. of Bezons, France has confirmed 19% growth in revenue from €10.7m in first-half 2025 to €12.7m for first-half 2026, driven by strong momentum in Services & Accessories and resilient Systems sales.

Services & Accessories revenue rose by 71% from €3m to €5.1m.

Systems revenue was €7.7m, roughly level with first-half 2025's €7.8m (for three machines delivered in each case).

Growth returns firm to profitability

Gross margin has risen from 36.2% to 39.8%.

Reflecting the revenue growth, higher gross margin, and disciplined operating expense management, operating income has improved by €0.8m, from a loss of €0.7m in first-half 2025 to a profit of €0.1m in first-half 2026.

Likewise, net income has improved by €1m, from a loss of €0.8m in first-half 2025 to a profit of €0.2m in first-half 2026, despite the complex international environment. This includes net financial income of €0.1m.

At the end of June, the cash position was €5.2m, up on €2.5m at end-June 2025 but down from €7.5m at end-December.

Shareholders' equity has fallen from €27.3m at year-end 2025 to €25.7m at end-June 2026, due mainly to a €2.1m distribution to shareholders from the issue premium account in June.

Financial debt (excluding IFRS 16) amounts to €6.4m, compared with €1.4m at end-December 2025 and €2.3m at end-June 2025. This includes €6m in bank borrowings arranged during first-half 2026 with Bpifrance and leading French banks.

Net debt (the cash position net of all financial debt, excluding IFRS 16) therefore amounted to €1.2m at end-June 2026, compared with net cash of €0.2m a year earlier.

Bank loans enable continued industrialization of ROSIE

Having secured the €6m in bank financing, Riber is continuing to implement its strategic roadmap.

The ROSIE (RIBER Oxide Silicon Epitaxy) platform is dedicated to the growth of functional oxides on 300mm silicon wafers, designed in accordance with SEMI industry standards. The technology targets integrated silicon photonics, with potential applications in electro-optical components for telecoms and data centers, as well as in certain quantum architectures. The second ROSIE system was shipped in July to a major quantum computing player in the USA.

Riber is now accelerating the industrialization of ROSIE II, a dual-chamber cluster production platform that is the next stage of development of ROSIE. "We are also reaching an important milestone, with the support of our financial partners, as we move forward with the construction of ROSIE II. This new platform will enable us to accelerate process qualification and prepare for technology's commercial deployment," notes chair & CEO Annie Geoffroy.

The system will support further technological maturation of the platform, accelerate the qualification of BTO/STO (barium titanate oxide/strontium titanate oxide) processes under industrial operating conditions, and prepare the technology for commercial rollout.

Riber says that it may use this first ROSIE II system to produce technology wafers or allocate it to an industrial customer. The first BTO/STO samples developed through the partnership with the Novo Nordisk Foundation Quantum Computing Programme (NQCP) will be available in fourth-quarter 2026. Riber says that several laboratories and industrial companies have confirmed their interest in technology through wafer pre-orders.

In addition, Riber has been invited to participate in the establishment of major industrial and technological partnerships, helping to support the development of new applications.

"We are continuing to strengthen our product offering by combining epitaxy and deposition technologies and developing process automation solutions," says Geoffroy. "We are therefore continuing to execute our roadmap, with the ambition of strengthening our offering around our established technologies and developing new opportunities in photonics, quantum technologies and advanced deposition technologies."

Services & Accessories order book doubles, offsetting drop for Systems

Riber says that commercial activity remains strong, particularly in applications related to datacom and quantum technologies.

At end-June, the total order book was €26.8m, down 3% on €27.7m a year ago, impacted by export restrictions to Asia (which prevented more than €8m in orders from being secured) and longer decision-making cycles at certain customers.

Systems orders are down by 27% from €22.5m to €16.5m, comprising four systems (three production systems and one ROSIE platform). However, this excludes the order announced on 9 July for a production system in Europe, scheduled for delivery in 2027.

Services & Accessories orders almost doubled, from €5.2m to €10.3m. This growth was supported in particular by sales of spare parts for recently ordered equipment, as well as several upgrade projects for long-standing customers in North America.

"The first half of 2026 confirms the strength of our core business in an international environment that remains complex," says Geoffroy. "Strong momentum in Services & Accessories, together with sus-

tained interest in our technologies, are encouraging signs," she adds.

Full-year 2026 outlook

Riber reiterates that its sales remain structurally seasonal, with deliveries traditionally weighted toward the second half of the year, so first-half results cannot be extrapolated to the full year.

The firm says that its addressable markets continue to benefit from favorable structural trends, particularly in photonics, artificial intelligence and quantum technologies. It also continues to see sustained demand for its Services & Accessories. Subject to obtaining an export license for Asia, Riber expects full-year 2026 revenue to be broadly in line with 2025.

Governance

At its meeting on 22 September, Riber's board of directors acknowledged the resignation of Nicolas Grandjean as an independent director for professional reasons. The board thanks Grandjean for his contribution to its work and commitment throughout his term of office.

www.riber.com

New order received from 3SP for production platform

Riber has received a new order from 3SP Technologies S.A.S. of Nozay, Essonne, France — a long-standing customer for more than 20 years — for an industrial passivation platform. The system is scheduled for delivery in 2027.

Founded in 1994 and, since 2014, a subsidiary of China's O-Net Technologies (Shenzhen) Group Co Ltd (which provides optical networking products for telecoms and datacoms applications), 3SP designs and manufactures optoelectronic components, including III-V semiconductor laser chips, photonic integrated circuits and modules for data-center and telecoms applications.

The new system will enable 3SP to expand its industrial production capacity in order to meet growing demand for high-performance photonic components used in next-generation optical networking applications.

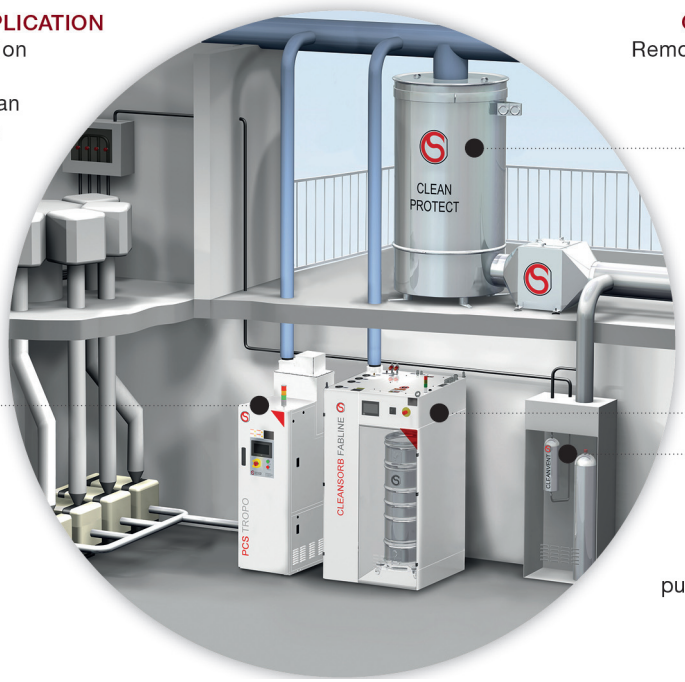
"This new order will significantly increase the production capacity of 3SP Technologies' 980nm high-power laser diodes," says Austin Na, chairman of 3SP and chairman & CEO of O-Net Communications Group. "This will enable 3SP Technologies to enhance its customers' support to better satisfy the booming demand for these products in data-center interconnects, Hyper-rails system and other industrial applications, and reinforce 3SP Technologies' leading position in this growing market," he adds. "It also reflects 3SP's lasting confidence in Riber, built on more than two decades of partnership."

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Micross acquiring AEMtec, expanding reach into Europe

Acquisition broadens advanced packaging, optoelectronics and test capabilities

Micross Components Inc of Melville, NY, USA (which provides high-reliability microelectronic products and services for aerospace, defense, space, medical, energy, communications and industrial applications) has entered into a definitive agreement to acquire AEMtec GmbH of Berlin, Germany (a portfolio company of Capiton that provides complex micro- and optoelectronic modules, advanced packaging, test & assembly services for high-reliability applications).

The acquisition enhances Micross' presence in continental Europe and broadens its portfolio of high-reliability microelectronic services and products. AEMtec specializes in delivering end-to-end solutions across the entire packaging and integration value chain — from design, prototyping and industrialization through qualification, series production and lifecycle support. Its technology portfolio spans wafer back-end services and wafer testing, chip-on-board, flip chip, 3D integration and opto packaging, all performed in cleanroom facilities in Berlin and Dresden, Germany, and Boston, Massachusetts. Its expertise in miniaturization and high-precision assembly enables highly reliable solutions for demanding customer requirements.

Serving customers across the semiconductor, medical and biotechnology, industrial automation, communications and aerospace & defense sectors, AEMtec offers customized solutions for complex, mission-critical requirements. Its reputation for engineering and reliability is said to have made it a trusted, single-source development and manufacturing partner to blue-chip customers bringing high-performance products to market. AEMtec's management team, led by CEO Robert Giertz, will join Micross.

Micross' acquisition — the eleventh under the ownership of Behrman Capital and seventh since consummating a continuation fund transaction in February 2022 — continues to build on its strategic priorities, namely broadening its advanced packaging, photonics and test capabilities.

The acquisition also materially expands Micross' manufacturing and engineering footprint in Europe, positions it closer to leading European customers, and better positions it for future growth opportunities. It also enhances Micross' ability to serve existing customers with advanced optoelectronic packaging capabilities, while expanding its European manufacturing footprint to further support the European defense industrial base.

AEMtec's "world-class expertise in advanced packaging, photonics and optoelectronics will augment our capabilities and accelerate our ability to deliver cutting-edge solutions to our customers," says Micross' CEO Jim Cannon. "AEMtec establishes our first scaled foothold in continental Europe, augmenting our existing European facilities in the UK and Denmark, and positions Micross as a leading supplier of high-reliability microelectronic products and services. Together, we look forward to pursuing new business opportunities and expanding our reach in high-growth markets across Europe and beyond," he adds.

"Our broad technological expertise and end-market exposure strategically align with Micross' capabilities," notes AEMtec's CEO Robert Giertz.

"Micross' acquisition of AEMtec enhances the combined company's strategic position in the high-reliability microelectronics market," comments Behrman Capital managing partner Simon Lonergan. "This acquisition underscores the company's commitment to a truly global offering of high-reliability products and services, allowing us to access the high potential European market."

Completion of the transaction is expected in second-half 2026, subject to customary regulatory approvals.

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www.micross.com

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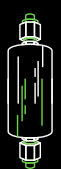
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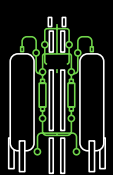
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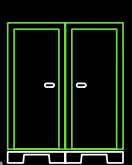
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Aehr receives over $8m in SiC wafer-level burn-in orders as global EV programs accelerate

Expanded production orders from lead SiC customer, and growing engagement with leading automotive suppliers highlight strengthening SiC market

Aehr Test Systems of Fremont, CA, USA — which provides solutions for testing, burning-in and stabilizing semiconductor devices in wafer-level, singulated die, and packaged-part form — has received more than $8m in new silicon carbide wafer-level burn-in (WLBI) orders.

The orders include a significant follow-on order for additional FOX WaferPak full-wafer Contactors from its lead silicon carbide production customer to support expanded manufacturing capacity for new electric vehicle platforms, particularly those serving the rapidly growing China EV market. The large WaferPak order reflects increased production activity and utilization at the customer, as demand for SiC power devices continues to improve. In addition to these WaferPak orders, the customer indicated additional future capacity requirements beyond this order in Aehr's current fiscal year.

Aehr also received a key order directly from one of the world's largest automotive companies for multiple WaferPaks to be used in the qualification of SiC devices from suppliers for their new generation of EVs using Aehr's FOX wafer-level burn-in systems.

The new orders reflect "strengthening momentum in the power semiconductor WLBI market and the beginning of the next phase of growth for this portion of our business," believes president & CEO Gayn Erickson. "Our lead silicon carbide production customer continues to expand capacity with additional WaferPak orders supporting new electric vehicle programs, particularly in China where electric vehicle adoption continues to accelerate," he adds.

"Perhaps even more encouraging is what we are seeing with the new WaferPak order directly from one of the top two leading automotive companies in the world that is using our FOX systems and proprietary WaferPaks to qualify the quality and reliability of multiple silicon carbide companies around the world for their planned electric vehicle expansions. We are actively engaged with several of the world's largest automotive companies, and with several leading silicon carbide device manufacturers who are supporting their next-generation electric vehicle platforms as they evaluate deploying WLBI in production. These companies recognize the increasing importance of screening for early-life failures at the wafer level, before packaging, to improve long-term reliability and reduce manufacturing costs. We believe these engagements represent significant future production opportunities for Aehr as WLBI continues to gain acceptance as a critical manufacturing step for high-reliability automotive power semiconductors," Erickson continues.

Our lead silicon carbide production customer continues to expand capacity with additional WaferPak orders supporting new electric vehicle programs, particularly in China where electric vehicle adoption continues to accelerate

"We also recently secured our first silicon carbide customer in Taiwan last quarter, expanding our presence in another key semiconductor manufacturing region for automotive and industrial applications. This customer works closely with several automotive manufacturers in Taiwan and China, as well as with other international companies," he notes.

"The outlook for electric vehicles continues to improve following a period of inventory adjustments across parts of the automotive market. Industry forecasts point to renewed growth in Europe, increasing electrification initiatives in Japan, and continued leadership by China, where electric vehicles now account for more than half of new passenger vehicle sales. At the same time, the transition toward higher-voltage vehicle architectures, faster charging systems, and improved drive-train efficiency is increasing demand for advanced silicon carbide power semiconductors that require the highest levels of reliability."

"We are also seeing growing interest in WLBI from customers developing silicon carbide devices for industrial automation, renewable energy, energy storage, charging infrastructure, aerospace, and AI data-center power systems. As these markets continue to expand and reliability requirements become increasingly stringent, we believe Aehr is uniquely positioned with the industry's most proven production WLBI solution."

"With an expanding installed base, a growing pipeline of production opportunities, and increasing engagement with both leading automotive suppliers and silicon carbide device manufacturers worldwide, we are excited about the opportunities ahead and believe we are well positioned to benefit as silicon carbide WLBI adoption accelerates."

www.aehr.com

Aehr receives follow-on production order from lead silicon photonics customer

Aehr has received a follow-on production order from its lead silicon photonics wafer-level burn-in (WLBI) customer for a fully automated FOX-XP multi-wafer production burn-in system, to ship in first-half 2027 to support the continued expansion of its manufacturing capacity for next-generation silicon photonic integrated circuits.

The AI industry is rapidly transitioning from moving electrons to moving photons, driving a significant expansion in silicon photonics as hyperscale data centers seek higher bandwidth, lower latency, improved power efficiency, and greater scalability. As silicon photonic integrated circuits become increasingly critical to next-generation AI networking, optical switching, co-packaged optics, linear pluggable optics and chip-to-chip optical I/O architectures, manufacturers are placing greater emphasis on production-scale reliability screening and WLBI to ensure long-term performance while improving manufacturing yields and reducing production costs.

The ordered system is configured with nine independent WaferPak test blades, each capable of delivering up to 3500W of power for production burn-in and reliability screening of high-performance silicon photonic integrated circuits used in optical transceivers and emerging chip-to-chip optical I/O applications. The system also includes Aehr's fully integrated automated wafer-level handling solution, consisting of the FOX-XP multi-wafer production burn-in system, integrated WaferPak Auto Aligner, robotic wafer handling, and automated wafer loading and unloading, providing a complete high-volume automated WLBI solution.

"This production order is another indication that silicon photonics is moving from technology adoption into manufacturing scale-up, and we believe that transition represents a significant long-term growth opportunity for Aehr," says president & CEO Gayn Erickson. "The order reflects our lead silicon photonics customer's continued expansion of manufacturing capacity and represents another important milestone in the industry's transition toward high-volume production of silicon photonic integrated circuits," he adds.

"As AI clusters continue to grow in size and performance, silicon photonics is emerging as a key enabling technology for delivering the bandwidth, power efficiency and scalability required by next-generation AI infrastructure. What began with optical transceivers is now expanding into optical switching, co-packaged optics, linear pluggable optics, and chip-to-chip optical I/O.

"At the same time, the industry is moving toward more highly integrated optical architectures that integrate or closely co-package laser sources with silicon photonic integrated circuits. These advances improve performance, reduce system cost, simplify manufacturing, and make device reliability even more critical.

"As silicon photonic devices continue to increase in complexity, power density and production volumes, we believe WLBI is becoming a foundational manufacturing step for many of these next-generation devices. Identifying latent defects and stabilization of the integrated lasers before packaging improves manufacturing yields, lowers overall production costs, and enables the long-term reliability demanded by hyperscale AI infrastructure.

"Over the past year, we've seen a meaningful increase in engagement from silicon photonics companies around the world spanning engineering qualification systems, production capacity planning, and next-generation device roadmaps. These discussions reinforce our belief that the market is approaching an important inflection point.

"As production requirements evolve toward higher power, fully automated wafer-level manufacturing and larger production volumes, we believe our FOX-XP platform and integrated automated wafer-level handling solution position Aehr to become the production standard for wafer-level reliability screening of silicon photonic integrated circuits," Erickson reckons.

Industry analysts project strong growth for silicon photonics through the remainder of the decade as hyperscale AI infrastructure, cloud computing, high-performance computing, and advanced optical networking continue driving demand for higher-bandwidth and lower-power interconnect technologies. Emerging applications including co-packaged optics, optical switching, linear pluggable optics, and chip-to-chip optical I/O are expected to further expand the adoption of silicon photonics throughout AI infrastructure. Industry research also points to increasing adoption of integrated and co-packaged laser architectures that improve optical performance, manufacturing scalability, and system efficiency while further increasing the importance of production reliability screening.

Aehr says that its FOX-XP multi-wafer production burn-in system performs full WLBI, stability testing and production screening of semiconductor devices while enabling customers to test multiple wafers simultaneously in a highly automated manufacturing environment. The FOX-XP platform supports silicon photonics, silicon carbide power semiconductors, AI processors, optical devices, and other semiconductor products requiring production burn-in and reliability screening.

www.aehr.com

ClassOne wins multi-system Solstice S8 follow-on orders from photonics manufacturers for high-volume 6-inch InP gold plating

Orders key to production ramp for InP photonics, supporting next-gen optical interconnects for AI data centers

ClassOne Technology of Kalispell, MT, USA (which manufactures electroplating and wet-chemical process systems for ≤200mm wafers) says that two "industry-leading" photonics manufacturers have placed follow-on production orders for multiple Solstice S8 single-wafer wet processing systems. Configured with ClassOne's GoldPro electroplating chambers, the Solstice systems will be used for high-volume gold electroplating of 4-inch and 6-inch indium phosphide (InP) wafers key to next-generation optical devices for artificial intelligence (AI) data centers and other high-bandwidth communications applications.

The Solstice systems deliver what is said to be advanced gold plating performance to provide the throughput and process consistency required for volume InP manufacturing. These customers, which leverage Solstice as their global process tool of record for gold plating, anticipate deploying multiple additional systems as InP-based transceiver production capacity expands, underscoring the accelerating demand for high-bandwidth optical interconnects in AI infrastructure. These customers are said to value the Solstice system's flexibility, which allows for metal lift-off, wet etch and other processes to be added on the same platform.

High-volume manufacturing of InP-based optical devices requires extremely uniform thickness and surface roughness control to ensure device performance, yield and long-term reliability, notes ClassOne. As AI model complexity and data-center bandwidth requirements continue to increase, InP photonics is rapidly becoming a critical technology for enabling faster, lower-power data transmission. According to industry analyst firm Yole Group, AI data-center scaling is driving massive growth in photonics. By 2031, the optical transceiver market is projected to reach $112bn, while the photonics packaging market is forecast to hit $14.4bn — deployment of co-packaged optics (CPO) is dramatically accelerating the consumption of InP lasers essential to photonics ICs.

"The photonics market has reached an important inflection point as manufacturers ramp to high-volume production," says ClassOne's CEO Byron Exarcos. "These orders and anticipated additional follow-ons reflect these vital customers' confidence in our ability to deliver the process performance, throughput and manufacturing scalability required for next-generation photonics production," he adds. "We're excited to further support these technology leaders as optical interconnects become essential to AI infrastructure."

ClassOne says that its plating technology is specifically engineered for demanding semiconductor applications requiring exceptional thickness control, wafer-to-wafer repeatability and production-ready throughput. These latest orders, which closely follow recently announced Solstice S8 photonics purchases, further illustrate the industry's focus on building the manufacturing infrastructure needed for the next generation of AI connectivity, the firm adds.

www.classone.com/products

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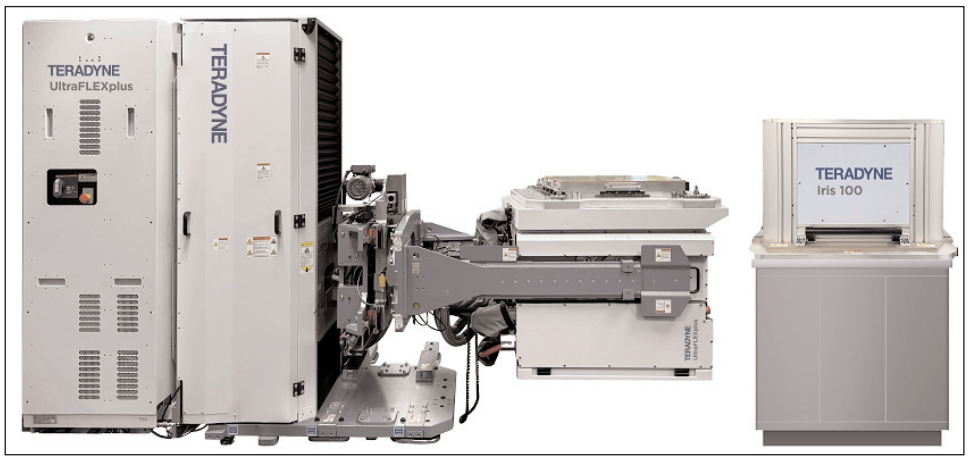
Teradyne launches Iris 100 test system for μLED devices

Semiconductor-grade test for next-generation optical interconnects powering scale-up in AI data centers

Automated test equipment and advanced robotics provider Teradyne Inc of North Reading, MA, USA has launched Iris 100, a production-ready optical test platform for micro-LED devices. The Iris 100 brings semiconductor-grade optical test to micro-LED manufacturing, measuring every individual emitter in an array and integrating directly with the Teradyne UltraFLEXplus platform for combined optical and electrical test.

Micro-LED technology underpins two of the fastest-moving areas in advanced electronics: augmented reality (AR) microdisplays and optical data interconnects for AI data-center architectures. Both depend on devices that contain hundreds of thousands to millions of individual emitters, each of which must be characterized with production-level precision and throughput. Bench-top optical instruments can characterize these devices in the lab, but they cannot deliver the throughput and cost-per-unit economics that volume manufacturing requires.

The Iris 100 was engineered for high-volume precision manufacturing with its spectrometer and high-resolution camera that measure the spectral response of the array, and per-pixel luminance and uniformity. Advanced test parallelization and image-processing algorithms enable characterization of a full array containing millions of micro-LEDs with high throughput. Leveraging Teradyne's widely adopted IG-XL software, Iris 100 detects optical defects such as dead/stuck pixels and cluster defects early in the manufacturing process. Its NIST-traceable calibration workflow enables absolute measurements that correlate lots, wafers and manufacturing sites.



"Micro-LED is shifting from lab to volume production for both AR microdisplays and, increasingly, optical interconnects, which are becoming foundational to how AI data centers scale beyond copper," says Shannon Poulin, president of the Semiconductor Test division. "Both technologies demand per-emitter test at production throughput, and Iris 100 delivers that today on test infrastructure our customers already run at scale."

The Iris 100 follows the introduction of Teradyne's Photon 100 for silicon photonics and co-packaged optics (CPO) test earlier this year and the acquisition of photonic test specialist Quantifi Photonics in 2025, extending Teradyne's test capabilities across the full spectrum of emerging optical test requirements. Iris 100 supports wafer and final test, letting manufacturers add micro-LED test to fleets they already run, with a roadmap to support photodetector test capabilities in the same insertion.

www.teradyne.com/products/iris-100

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Avicena demos connectorized μLED optical interconnect

During the European Conference on Optical Communication (ECOC 2026) in Málaga, Spain (21–23 September), Avicena Tech Corp of Sunnyvale, CA, USA demonstrated what it claims is the industry's first connectorized micro-LED optical interconnect.

The new LightBundle eKit implementation combines Avicena's high-density, laser-free micro-LED transceiver technology with an inline detachable optical interface, providing a practical path to assembling, testing, servicing and upgrading optical connectivity in next-generation AI systems.

The announcement builds on Avicena's recent shipment of the world's first 1Tbps micro-LED optical interconnect evaluation kits. Those systems incorporate as many as 335 independent micro-LED data channels operating at up to 3Gbps per channel coupled through Avicena's multi-core fiber technology to integrated photodetector arrays. The connector uses an industry-standard MPO form factor combined with a ferrule optimized for multi-core fiber bundles.

By adding a connectorized optical interface, Avicena is advancing the LightBundle technology platform to meet the critical deployment requirements of AI infrastructure.

Bringing serviceable optical connectivity closer to the silicon

Avicena notes that artificial intelligence systems require rapidly increasing bandwidth between XPUs, memory, network interfaces, and switch fabrics. As these systems scale, conventional copper interconnects face growing limitations in reach, routing density, signal integrity, and energy efficiency.

Optics can overcome copper's reach limitations, but conventional optical technologies based on lasers and silicon photonics can introduce significant power, thermal, cost, packaging, and reliability challenges — particularly when optical connectivity must be placed close to high-performance compute and memory silicon, adds the firm.

LightBundle replaces lasers with dense arrays of micro-LED transmitters coupled through multi-core fiber to integrated photodetector arrays. Its wide-and-slow architecture distributes bandwidth across hundreds of low-power optical channels, enabling high aggregate throughput without requiring the extremely high per-lane speeds and complex signal processing associated with conventional optical links.

The new connectorized implementation adds the modularity required for practical system integration. A detachable optical interface can simplify system assembly, enable independent testing of electronic and optical subsystems, improve field serviceability, and support flexible routing between packages, boards, trays and racks.

"Introducing the world's first connectorized micro-LED optical interconnect marks an important step in moving micro-LED connectivity from breakthrough technology to a deployable platform for AI infrastructure," says CEO Marco Chisari. "Following the shipment of our 1Tbps LightBundle evaluation kits, we are now demonstrating how the same fundamental architecture can be implemented with the modularity and serviceability required by system manufacturers," he adds. "This advancement further extends Avicena's leadership and brings energy-efficient, terabit-class optical connectivity closer to broad deployment across XPU-to-XPU, XPU-to-memory, XPU-to-CPU, and XPU-to-switch applications."

Designed for AI scale-in and scale-up

LightBundle is designed to support optical connectivity across both scale-in and scale-up architectures, including:

- die-to-die and die-to-memory connectivity within or between packages;
- XPU-to-XPU and XPU-to-CPU interconnects;
- XPU-to-memory and memory-disaggregation architectures;
- XPU-to-switch and NIC-to-switch connectivity;
- board-to-board, tray-to-tray, and rack-to-rack links

The platform's integrated micro-LED and photodetector arrays are designed for low-power operation, high bandwidth density, robust performance at elevated temperatures, and flexible reach beyond the practical limits of high-speed copper.

Unlike laser-based architectures, LightBundle does not require external lasers, wavelength stabilization, optical modulators, or complex wavelength-division multiplexing. The architecture is also designed to integrate with a broad range of semiconductor processes and packaging approaches, allowing optical connectivity to be placed closer to compute, memory, and switching silicon.

"Adopting a new interconnect technology requires customers to understand how it will be manufactured, assembled, and serviced in their systems," comments Ben Bajarin, CEO & principal analyst of Creative Strategies. "Avicena's work on a connectorized interface addresses an important part of that challenge and is a necessary step toward making micro-LED interconnect technology practical for AI infrastructure, where customers have different requirements for bandwidth, power, and system design."

At ECOC, Avicena demonstrated a live inline connectorized LightBundle eKit link operating between micro-LED transmitter and integrated photodetector arrays. The demonstration highlighted:

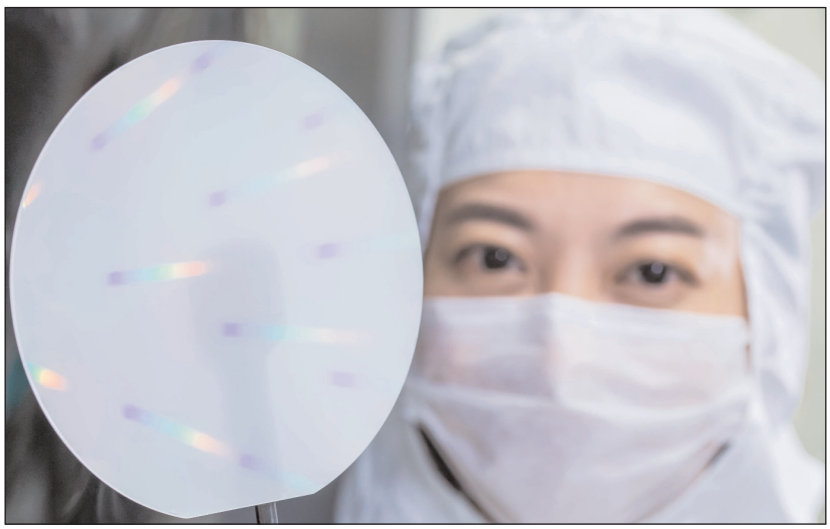
- detachment and reconnection of the optical interface;
- real-time data transmission across the connectorized link;
- high-density parallel connectivity through multicore fiber;
- link performance and bit-error-rate monitoring;
- compact fiber routing for space-constrained AI systems;
- reliable operation without lasers or optical modulators.

www.avicena.tech

Ennostar boosts blue micro-LED modulation bandwidth more than tenfold to 2.1GHz

Results approach commercial specs required for short-reach optical transmission

In what it claims is a breakthrough in micro-LED optical communications, Ennostar Corp of Hsinchu, Taiwan (a provider of integrated optoelectronic solutions, specializing in R&D and manufacturing III–V materials) says that its R&D team has increased the single-channel –3dB modulation bandwidth of its blue micro-LED to 2.1GHz at a current density of 2kA/cm^2. The sample further demonstrated a modulation bandwidth of up to 3.3GHz at a current density of 5kA/cm^2. These results approach the commercial specifications required for short-reach optical transmission using micro-LEDs, it adds.



Ennostar attributes the improvement in bandwidth to its expertise in III–V compound semiconductor epitaxial technologies, micro-LED chip architecture, and process integration. By optimizing both the epitaxial structure and material quality, the R&D team overcame previous performance bottlenecks, delivering substantially higher modulation bandwidth while simultaneously maintaining low power consumption and what it claims is excellent thermal management — two critical requirements for practical optical interconnect applications.

Ennostar says that it is advancing toward higher-bandwidth and energy-efficient transmission solutions to meet the escalating demands of AI workloads, hyperscale data centers, and high-performance computing (HPC).

As demand for next-generation optical interconnect technologies accelerates, Ennostar is continuing to expand its presence in emerging applications, with optical communications identified as one of its key strategic growth areas. The firm has a diversified technology roadmap based on three complementary optical light-source platforms: micro-LEDs, vertical-cavity surface-emitting lasers (VCSELs), and continuous-wave distributed feedback (CW-DFB) lasers.

Looking ahead, Ennostar aims to continue to enhance modulation bandwidth, improve electro-optical conversion efficiency, and strengthen device reliability, leveraging its core compound semiconductor technologies to deliver optical solutions for the next generation of high-speed data communications.

www.ennostar.com

CreeLED and Promier Products resolve patent dispute through limited license agreement

Patent infringement dispute related to LED components used in portable lighting

Cree LED Inc of Durham, NC, USA (a Penguin Solutions brand) and US-based Promier Products Inc (trading as LitezAll) have reached a mutually beneficial settlement resolving a patent infringement dispute involving Cree LED's patents related to LED components used in portable lighting products. As part of the settlement, Cree LED has granted Promier Products a limited license to certain Cree LED patents covering LED components.

Cree LED says that it has established itself as a trusted brand in portable lighting applications, known for consistently high performance and reliable product quality.
It adds that it is firmly committed to protecting its intellectual property and actively monitors the entire value chain of the global market to identify and address unauthorized use of its patented technologies. This ensures that Cree LED's innovations remain protected and that customers can rely on the integrity and performance of its solutions.

www.cree-led.com

Ingantec unveils 20% external quantum efficiency, 5µm red InGaN micro-LEDs emitting at 625nm

Native c-plane devices show high luminance and spectral stability at elevated current operations, advancing monolithic RGB technology

Fabless semiconductor company Ingantec Corp of Milwaukee, WI, USA has announced an advance in native red indium gallium nitride (InGaN) micro-LED technology, demonstrating greater than 20% peak external quantum efficiency (EQE) from 5µm-class red InGaN micro-LEDs fabricated on conventional c-plane epitaxial structures.

Co-founded by former Apple and Foxconn executives, along with University of Wisconsin-Madison faculty members, Ingantec is developing III–nitride materials and device technologies for next-generation micro-LED displays and photonic applications. Its proprietary InGaN-based technologies target pain points in micro-LED device performance and production, including the development of bright, efficient and spectrally stable red micro-LEDs that are compatible with blue and green GaN emitters, potentially eliminating complex mass-transfer process steps.

Presented by co-founder & CEO Alan Yeung at TechBlick's MicroLED Connect in Eindhoven, The Netherlands, the latest results demonstrate red InGaN emission near 620–625nm, with peak EQE at 4–5A/cm^2, the current density at which the devices reach their reddest emission. The devices subsequently maintain high single-digit efficiency (5–8% EQE) at elevated current densities spanning 40–140A/cm^2.

"The significance of this result is not simply achieving a high EQE number," says chairman & CEO Dr Alan Yeung. "We are demonstrating a combination of high efficiency, red emission, micron-scale dimensions, current-density robustness, and spectral control on a conventional c-plane InGaN platform. This is an important step toward making native red InGaN a practical foundation for monolithic RGB microdisplay architectures."

Unlike approaches based on quantum dots, nanowires, nanopyramids or photonic-crystal structures, Ingantec's devices utilize a conventional planar InGaN architecture, providing a pathway toward scalable wafer processing and full integration with green and blue InGaN micro-LED emitters.

Addressing red InGaN challenge

Producing efficient red emission from InGaN has historically been challenging because increasing indium incorporation introduces strain, defects, carrier localization, quantum-confined Stark effect (QCSE), efficiency degradation, and strong current-dependent wavelength shifts. Ingantec's approaches combine proprietary Spectrally Stable Red (SSR) technology with epitaxial and strain-engineering methodologies developed in collaboration with University of California Santa Barbara.

The resulting devices demonstrate an unusual combination of efficiency, wavelength behavior, and high-current-density robustness:

- 20+% peak efficiency: EQE exceeds 20% in 5µm-class red InGaN micro-LEDs, with peak efficiency occurring near 4–5A/cm^2 and emission near 625nm.
- Controlled spectral shifts: The devices initially red-shift with increasing injection — reaching their reddest wavelength that coincides with peak EQE emission — before exhibiting controlled blue-shifts across decades of current density.
- Useful efficiency at high injection: EQE remains in the 5–8% range over large portions of the 40–140A/cm^2 regime, demonstrating the potential for high-brightness operations.
- 5µm pixel scaling: Functional red InGaN micro-LEDs have been demonstrated, confirming device operation at dimensions relevant to ultra-high-pixel-density displays.

The optical results were obtained at UCSB using integrating-sphere measurements on planar InGaN devices, confirming true bulk efficiency.

From red InGaN to monolithic RGB

High-performance native red InGaN is a critical enabling technology for the development of monolithic RGB micro-LED displays based on a common III–nitride material platform.

A native InGaN red emitter offers the potential to reduce the reliance on heterogeneous red-emitter architectures and the associated assembly, transfer and integration complexity. Stable emission over a broad drive-current range can also reduce the burden on display CMOS systems to compensate for current-dependent color changes.

Ingantec's technology is being developed for applications including augmented-realty and mixed-reality (AR/MR) displays, automotive head-up displays (HUDs), mobile devices, high-brightness micro-displays, medical diagnostics devices, and advanced photonic systems.

Wafer-scale development and collaboration

Ingantec is extending the technology toward wafer-scale manufacturing and commercial foundry integration. Its development platform includes 4-inch InGaN-on-sapphire wafers containing hundreds of millions of potential red emitters.

Ingantec is inviting display makers, semiconductor foundries, backplane developers, optical technology firms and advanced packaging partners to accelerate commercialization of its native InGaN red µLED technology.

Collaboration areas include technology and application developments in µLED displays, medical diagnostics sensing, automotive HUDs, high-energy photonic systems, CMOS backplane integration, wafer manufacturing, and advanced packaging.

www.ingantec.com

Silanna unifies operating companies Silanna UV and Silanna Semiconductor under single corporate identity

Silanna of Pinkenba, Brisbane, Australia has unified its operating companies Silanna UV — which provides far-UVC light sources for water quality sensors, gas sensors, disinfection, and HPLC (high-performance liquid chromatography) applications — and Silanna Semiconductor of San Diego, CA, USA — which designs and manufactures analog-to-digital converters (ADCs) and specialty analog chips — under the single corporate identity of Silanna.

The company will operate through three technology divisions:

- factory-configurable analog digital converters (ADCs), which guarantee long-term supply chain security and lower costs;
- ultra-efficient laser drivers, which cut LiDAR and range-finder power losses in half; and
- UV LEDs, which enable chemical-free disinfection of water, air and surfaces.

Silanna will retain its R&D facility in San Diego, CA, and its epitaxy and fabrication manufacturing facility in Brisbane, Australia.

Products will be supported and made available through worldwide sales and operations teams, existing manufacturers representatives, and Silanna's international distribution partners.

By combining resources and technical expertise across these divisions, Silanna aims to accelerate the innovation of new analog technologies and advanced UV. The unified structure enables customers and partners across more territories to engage with a single organization for all its technology platforms.

"Silanna has always focused on solving complex engineering challenges through deep expertise. Bringing our semiconductor and UV technologies together under one brand will strengthen how we deliver for customers," says Silanna's managing director Rob Lobban.

Silanna says that the transition reflects its long-term strategy of turning breakthroughs in materials science and semiconductor engineering into scalable, real-world technologies for industrial and commercial markets.

www.silanna.com



NUBURU expands directed-energy platform into law enforcement and public security across USA and NATO

NUBURU Inc of Centennial, CO, USA (a dual-use defense & security integrated platform company) is expanding its directed-energy optical portfolio into law enforcement and public security via its subsidiary Lyocon S.r.l. The initiative extends NUBURU's One Optical Systems Hub beyond the battlefield and into everyday protective operations — public order, checkpoints and access control, tactical response and perimeter protection — with an initial go-to-market focus on the USA and NATO-member countries.

One Optical System Hub

At the center of the public security program is a Public-Security Dazzler designed to give trained operators a controlled, human-authorized optical response in the decisive gap where a verbal command has failed but kinetic force is not proportionate. Handheld, weapon-mounted and vehicle- and fixed-site configurations are in development to cover the full range of operational environments in which that gap occurs.

Both missions run on the same foundation: NUBURU's One Optical Systems Hub, a single photonics and optical-engineering core supporting public security and counter-UAS (unmanned aircraft system) optical denial. Each mission retains its own effects, operating parameters, safety envelopes, rules of engagement and validation pathway, but they draw on shared beam-control engineering, shared targeting and range-finding architecture, shared manufacturing and shared supply chain: one engineering investment, two addressable markets — and a cost structure that improves as volume accrues across both.

The public-security architecture is built around operator accountability from the outset: human-in-the-loop authorization, laser range-finding, distance-based output control, safety interlocks and tamper-evident engagement records. Around every fielded system, NUBURU intends to deliver integration, calibration, software updates, operator training and lifecycle support — the service layer that turns hardware placements into durable customer relationships.

Counter-UAS

NUBURU's counter-UAS work applies that optical core to one of the most urgent unsolved problems in Western security: small uncrewed aircraft over airports, ports, energy and utility sites, correctional facilities, military installations, borders and mass-gathering venues. The operators responsible for those sites face the same proportionality problem as the officer on the street. Kinetic interception is rarely available above a runway, a crowd or a refinery, and jamming is constrained where spectrum is contested or legally restricted.

Optical denial addresses the aircraft's ability to see rather than its ability to fly — no fragmentation, no falling debris, no spectrum footprint. It is a mission profile suited precisely to the populated and infrastructure-dense environments where drone incursions are most consequential and where existing counter-UAS answers are hardest to deploy. Because both missions are built on the same hub, engineering progress, qualification learning and manufacturing scale earned in one program carry directly into the other, and a single customer relationship can span perimeter security and airspace protection at the same site.

Large, fragmented and underserved customer universe

NUBURU is targeting federal, state and local police, border-security services, military police, special-response units and critical-infrastructure operators across that footprint — many of which are also the natural first customers for counter-UAS optical denial.

Pipeline already in motion

Through Lyocon, NUBURU is advancing an identified pipeline of prospective law-enforcement and protective-security opportunities in the USA and NATO-member countries, at varying stages of development and customer evaluation.

To accelerate industrialization and market access, NUBURU is in preliminary discussions and active outreach with established US and European firearms, electro-optics and defense-systems manufacturers regarding product integration and distribution. The aim is to pair NUBURU's optical-systems engineering with partners who already hold the qualification credentials, production capacity and channel relationships that these agencies buy through.

"Law-enforcement and public-security operators need tools that create time and distance when a verbal command has failed but kinetic force is not proportionate. That gap is where officers get hurt and where outcomes go wrong," says executive chairman & co-CEO Alessandro Zamboni. "The operator defending an airport or a power plant from a drone faces the identical problem one level up, and we are answering both with the same optical core. That is the logic of the One Optical Systems Hub — one engineering investment, two protective missions, each with its own authorization, safety controls and validation pathway," he adds. "With the right industrial and distribution partners, we can move through qualification and into the market across the USA and NATO-member countries far faster than we could alone."

Path to deployment

NUBURU's development pathway is structured around engineering validation, independent laser-safety and human-factors testing, certification, legal and export-control review, jurisdiction-specific use-of-force requirements and customer qualification. Performance, safety envelopes and operational effectiveness remain subject to completion of the applicable testing and certification processes.

www.lyocon.com

Initial Tekne laser dazzler counter-UAS test results

Controlled tests measured electro-optical sensor saturation and visual-acquisition denial across two UAV platforms

NUBURU has announced initial results from a laser dazzler counter-UAS test campaign at the facilities of Tekne S.p.A. in Italy.

Performed by NUBURU Group and Tekne technical teams, it generated measured evidence supporting the integration of NUBURU's laser technology into Tekne tactical systems and future NUBURU Defense Italy mission packages under the NUBURU Defense Italian Plan, subject to required authorizations, product qualification, safety review, customer requirements and export-control constraints.

The aim of the campaign was to assess the effectiveness of NUBURU's laser dazzling technology against electro-optical drone sensors. Tekne engineers and technical specialists measured sensor saturation and optical disruption across multiple operational configurations, with the goal of translating the data into product architecture, configuration and test-roadmap decisions.

Initial laser dazzler test campaign and technical results

The trials were conducted in a controlled indoor environment simulating the engagement of a hostile unmanned aerial vehicle (UAV). In the tested configurations, NUBURU's dazzling technology achieved complete suppression of the drone's electro–optical sensors by overwhelming the optical source, effectively denying visual acquisition.

A significant outcome emerged during tactical approach simulations. In a scenario in which a hostile drone was tasked with detecting and tracking a designated neutralization operator, the operator approached to within about 20m of the target without being detected. This result supports the potential use of optical dazzling to help conceal personnel during close-range counter-UAS operations, potentially enabling other approved measures to neutralize a threat.

The test campaign included two different drone platforms, confirming versatility across multiple UAV configurations. Trials were performed using both continuous-wave and pulsed laser operation at irradiance levels ranging from 0.1mW/cm^2 to 0.5mW/cm^2, fully compliant with applicable optical safety regulations. Extra comparative evaluations were conducted at irradiance levels up to five times higher than regulatory exposure limits solely to characterize system performance. In all configurations tested, the dazzling effect remained consistently effective.

Testing was carried out inside a Tekne facility over a maximum range of about 100m, corresponding to the physical limitations of the indoor test environment. Based on laser beam-propagation physics, NUBURU believes that the experimental data can support modeling and extrapolation for operational engagement distances measured in kilometers, with product-configuration work initially focused on scenarios starting at about 1km and extending beyond that range, subject to further testing and validation.

Building on the data collected during the Tekne test campaign, NUBURU's product-development roadmap now includes next-generation integrated dazzler systems combining green, blue and infrared laser sources within a single device architecture. These non-kinetic counter-UAS solutions are intended to provide day- and night-time protection across land, maritime and fixed-site operational environments, where authorized.

Counter-UAS market context and TAM/SAM/SOM framework

NUBURU believes that the test results are commercially relevant because counter-UAS demand is expanding rapidly and customers are increasingly seeking layered, integrated architectures. Third-party estimates frame the global anti-drone/counter-UAS market at about $4.48bn in 2025 and $14.51bn by 2030 under one definition, and at about $14.41bn in 2026 and $55.25bn by 2034 under a broader counter-UAS definition. Grand View Research/Horizon estimates the laser-system anti-drone segment to be about $1.46bn in 2024 and $12.77bn by 2033, implying an approximately 27% compound annual growth rate (CAGR) over 2024–2033.

For product framing only, NUBURU views total addressable market (TAM) as the broader anti-drone/counter-UAS market; serviceable available market (SAM) as the laser-system, optical-defense and directed-energy counter-UAS mission-package segment; and serviceable obtainable market (SOM) as the initial NUBURU/Tekne opportunity that may be addressable through authorized demonstrations, vehicle and fixed-site integrations, and mission-package sales. This framework does not represent revenue guidance, backlog, contracted demand or a forecast of company results.

Competition includes RF jamming, protocol-takeover systems, high-power microwave, hard-kill interceptors, high-energy laser programs and command-and-control platforms. NUBURU intends to position its optical-defense roadmap as a complementary non-kinetic sensor-denial layer integrated with Tekne mobility/EW-CEMA capabilities.

www.nuburu.net

BluGlass appoints global capital markets veteran to board

Shareholder Yam Rubenstein's expertise and network to improve access to non-dilutive alternative funding sources

BluGlass Ltd of Silverwater, Australia — which develops and manufactures gallium nitride (GaN) visible laser diodes based on its proprietary low-temperature, low-hydrogen remote-plasma chemical vapor deposition (RPCVD) technology — has appointed Yam Rubenstein as a non-executive director to support its growing global operations.

Rubenstein is an Israel-based entrepreneur and investor, with more than two decades of experience in global financial markets. He is the founder & CEO at investment firm 102 Percent Ltd, providing corporate finance, investment and strategic advisory services across technology, fintech and capital market sectors. Rubenstein is also an advisory board member for Nasdaq-listed AI-powered disinformation detection company Cyabra.

He has previously held senior management roles at leading investment houses and banks in Israel, including deputy CEO of Migdal Capital Markets for more than 10 years, where he developed and led the prime brokerage business, traded all financial instruments globally, and built relationships with top-tier investment banks and institutional investors around the world.

As co-founder of June 76 investments, Rubenstein is one of BluGlass' largest shareholders as well as a major investor in ASX-listed advanced manufacturing company Amaero International Ltd and place intelligence platform Beonic Ltd.

"Yam is an excellent addition to BluGlass' refreshed board, bringing global financial acumen and extensive industry networks across Israel's defence, aerospace and deep-tech sectors," comments executive chair Omer Granit. "His global capital markets expertise will be invaluable as we continue to recapitalize the company to accelerate growth, increasing access to investment banks and alternative funding sources. Yam's appointment complements and further strengthens the board's composition, expanding our financial and customer networks beyond Australia and the USA. His existing investment in BluGlass supports the founder mentality we are fostering across the business and ensures board decisions are aligned with those of shareholders," he adds.

"I've followed BluGlass' journey over the past year and have been impressed by the calibre of its growing customer base, technical innovation, and market opportunity," comments Rubenstein. "The company is now at a critical inflection point in its commercialization journey with industry-leading visible laser technology and highly coveted development contracts with the US Government and tier-one leaders," he adds. "I look forward to leveraging my existing networks across global capital and technology markets to support the delivery of existing contracts, facilitate new introductions to prospective partners and customers, and fast-track BluGlass' growth trajectory."

www.bluglass.com.au

BluGlass secures new AUS$8m R&D loan facility, replacing existing AUS$2.27m facility

Extra AUS$5.5m to be used for scaling production and developing lasers for quantum sensing, advanced manufacturing, and defence

BluGlass has agreed terms with Rockford RDF Pty Ltd as trustee for the Rockford RDF Unit Trust for a new AUS$8m R&D financing facility. The facility will refinance the firm's existing Radium facility and, net of that repayment, provide about AUS$5.5m of additional funding liquidity. The facility will support BluGlass' working capital requirements and growth initiatives.

The facility carries an interest rate of 16.5% per annum and a 2.5% establishment fee, comprising AUS$100,000 capitalized into the loan balance and AUS$100,000 payable in BluGlass shares. AUS$2.75m is scheduled to be repaid from the fiscal year 2026 R&D Tax Incentive refund, with the balance to be repaid from the fiscal year 2027 R&D Tax Incentive refund and no later than 1 March 2028. The facility is secured by first-ranking security over the fiscal 2026 and fiscal 2027 R&D Tax Incentive refunds, together with a limited feather-weight security over the company's other assets.

"The new debt facility gives BluGlass early access to anticipated R&D Tax Incentive refunds that will be used to advance our operational and commercial objectives," says CEO & managing director Jim Haden. "Most notably, these include scaling our production capabilities, converting revenue opportunities, and continuing to develop differentiated laser solutions for various high-growth markets such as quantum sensing, advanced manufacturing, and defence."

Vexlum appoints president of the Americas

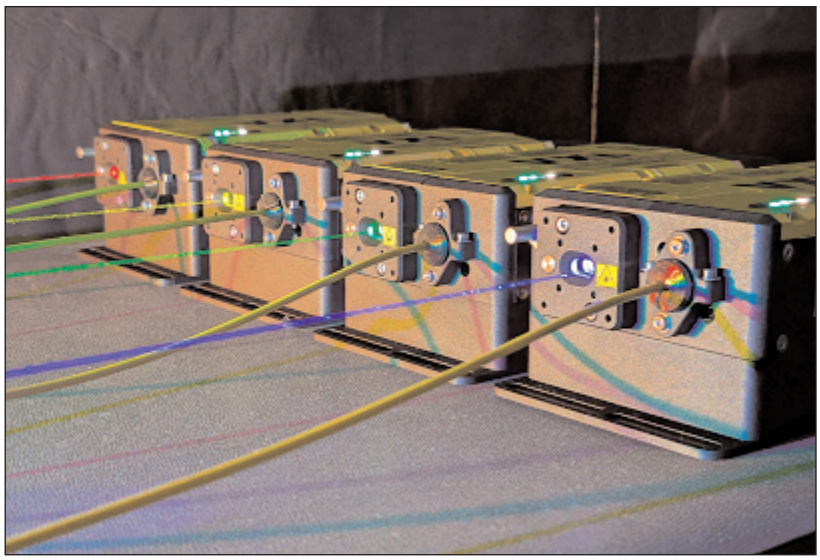
Erik McKee to oversee operations and growth across North and South America

Finland-based Vexlum — which was spun off from Tampere University of Technology's Optoelectronics Research Centre in 2017 and develops and manufactures high-power semiconductor vertical-external-cavity surface-emitting laser (VECSEL) technology systems — has appointed Erik McKee as president of the Americas. Based in Denver, Colorado, he will oversee operations and growth across North and South America, supporting accelerating demand for the company's laser technology in quantum, semiconductor, space, medical and other advanced industrial and scientific applications.

The appointment underscores Vexlum's rapid growth in the Americas, where its VXL laser system has emerged as a platform for scaling atom- and ion-based quantum computers, among other applications. By reducing the volume of traditional tabletop and rack-mounted laser platforms by more than 20-fold into a compact 2-liter system, the VXL platform replaces bulky laboratory instrumentation with an integrated laser engine.

Vexlum's technology has its roots in a partnership between semiconductor experts at Finland's Tampere University and the quantum research group of Nobel laureate David Wineland at the US National Institute of Standards and Technology (NIST) in Colorado. This foundation has established Vexlum's VECSEL technology as providing the reliability and operational stability required across a range of quantum applications including quantum computing, quantum networking, quantum sensing, and transportable optical clocks.

"His perspective and experience within the laser industry will be a critical addition as we work to best support our customers across a wide range of fields and applications," comments Vexlum's CEO & co-founder Jussi-Pekka Penttinen. "Erik's experience in laser development will also be a valuable resource as we continue to bring our laser platform to new applications and industrial use cases."





Erik Mckee.

Vexlum says that the versatility of its 'any-wavelength' capability allows it to simultaneously service an expansive range of high-growth applications across diverse industries. This includes high-power UV lasers for applications such as semiconductor inspection, as well as specialized yellow guide-star lasers for space awareness. The compact, resilient design of the VXL platform further establishes Vexlum as a vital partner for the next generation of transportable optical clocks and advanced scientific research.

McKee has more than a decade of experience delivering complete laser solutions across the scientific and industrial communities, with expertise spanning the UV through mid-IR wavelength ranges. His work has supported a broad array of research and industrial applications, with a particular focus on the rapidly growing quantum sector, including quantum computing, sensing, networking, and positioning, navigation, and timing (PNT).

McKee holds both undergraduate and graduate degrees in physics and optics from the University of Central Florida (UCF), where his research focused on laser technology R&D. He went on to work in industrial R&D, advancing solid-state laser architectures, including thin-disk, slab, fiber and rod technologies.

"I am excited to strengthen Vexlum's presence across the Americas and to work closely with the scientific and industrial communities here to help advance their projects with these next-generation laser solutions," says McKee.

"Vexlum's vertical integration and ability to grow and process semiconductor materials in-house is a massive benefit for quality control, rapid prototyping, development, and supply chain and risk management," he adds. "Pairing that with the team's laser development and systems integration expertise puts Vexlum in a unique position for rapid growth and innovation to support the market's growing needs."

www.vexlum.com

ams OSRAM unveils 850nm thin-film micro-VCSEL arrays for AI scale-up

ams OSRAM AG of Premstaetten, Austria, and Munich, Germany has unveiled its latest thin-film VCSEL for AI scale-up, showcasing a connectorized multi-core fiber solution and expanding the ecosystem network.

As artificial intelligence continues to drive unprecedented growth in computing infrastructure, moving data efficiently is becoming just as critical as processing it, says the firm. The increasing scale of AI training and inference clusters is placing new demands on optical interconnect technologies, requiring higher bandwidth, lower latency and significantly improved power efficiency.

To address this emerging opportunity, ams OSRAM is expanding its Digital Photonics strategy. Building on its expertise in intelligent light emitters, optical sensors and advanced semiconductor manufacturing and assembly, the firm is unveiling key photonic building blocks required for next-generation AI infrastructure. These include addressable micro-emitter arrays based on both LED and VCSEL technologies, as well as matching micro-photodiode arrays that together form the optical foundation of future ultra-high-bandwidth interconnect architectures.

At the European Conference on Optical Communications (ECOC 2026) in Málaga Spain (21–23 September), ams OSRAM unveiled its latest thin-film VCSEL technology and demonstrated a connectorized multi-core fiber solution in collaboration with BizLink, maturing the ecosystem for highly parallel, ultra-low-power optical interconnects for AI scale-up.

Building a wide-and-slow ecosystem for AI infrastructure

Following the strategic customer cooperation announced earlier this year with a confidential industry partner, ams OSRAM continues to broaden its ecosystem for wide-and-slow optical interconnect architectures.

It is collaborating with multiple partners across the value chain, including testing, fiber infrastructure, connector technologies, packaging and system integration, with the objective of accelerating industry adoption of next-generation optical interconnect solutions.

BizLink joins this growing ecosystem as a specialist in optical connectivity and connector solutions and is supporting the development of the ECOC demonstrator.

From adaptive headlamps to AI data movement

ams OSRAM says that the foundations of its optical interconnect technology were established long before the emergence of today's AI infrastructure market.

ams OSRAM's optical interconnect technology builds on the same core technology platform that enabled the commercialization of the EVIYOS digital lighting solutions.

Combining highly addressable micro-emitter arrays, CMOS integration, wafer-level manufacturing know-how and advanced packaging technologies, EVIYOS has demonstrated the scalability and manufacturability of ams OSRAM's Digital Photonics platform in high-volume production. The platform has also proven ams OSRAM's ability to serve demanding markets requiring consistent quality, reliability and production scalability across millions of devices.

The same technology principles are now being extended into AI infrastructure as well as mobile/wearable applications. What began as a highly addressable micro-emitter architecture for adaptive headlamps is evolving into a photonics platform capable of moving data with exceptional energy efficiency and scalability.

Re-thinking optical interconnects with wide-and-slow architectures

The rapid scaling of AI clusters is reshaping requirements for intra-datacenter connectivity. Future AI scale-up networks will require interconnects that simultaneously optimize power consumption, latency, density, reliability and cost.

ams OSRAM is targeting this challenge through a highly parallel wide-and-slow optical architecture. Instead of transmitting increasing amounts of data through a limited number of highly complex channels, data is distributed across a large number of lower-speed optical lanes. Realizing such highly parallel architecture also requires corresponding advances in fiber and connector technologies, highlighting the critical importance of the ams OSRAM and BizLink partnership.

This approach reduces overall system complexity while enabling lower latency, lower power consumption and scalable bandwidth growth. As AI clusters continue to expand, the wide-and-slow architecture offers a promising path toward more sustainable and cost-efficient infrastructure, says ams OSRAM.

Thin-film micro-VCSEL platform for AI scale-up networks

ams OSRAM continues to expand its photonics portfolio through the development of a next-generation 850nm thin-film VCSEL platform specifically designed for AI scale-up interconnects.

The platform combines several differentiating technologies in a single architecture, including top-emission thin-film VCSELs, dense 25µm-pitch micro-VCSEL arrays with addressability, silicon TSV integration and compatibility with standard multi-mode fiber infrastructure. This enables highly parallel optical links with exceptional packaging density and ultra-low-power operation.

The firm has completed micro-VCSEL integration on silicon TSV substrates and demonstrated error-free 32Gb/s NRZ operation. The platform achieves an energy efficiency of about 0.25 pJ/bit while

maintaining compatibility with scalable manufacturing approaches. This level of efficiency highlights the potential of highly parallel optical architectures to support future bandwidth scaling while minimizing power consumption.

In addition, reliability testing has shown no failures after more than 2000 hours under elevated junction temperatures and current overstress conditions.

Building on these results, ams OSRAM is advancing the development of fully integrated 3D photonics stacks combining micro-VCSEL arrays, micro-photodiode arrays and mixed signal CMOS electronics for future ultra-high-bandwidth optical interconnect architectures.

www.ams-osram.com

PicoJool raises $27.5m in Series A round

Funding to accelerate commercialization of 200G, 50G micro-VCSELs, and optical connectivity products for AI infrastructure

PicoJool Inc of Palo Alto, CA, USA (which is developing optical chips and modules for high-bandwidth, low-cost connectivity in hyperscale AI data centers) has raised $27.5m in Series A funding led by Socratic Partners, with participation from Hudson River Trading (HRT). Following a $12m seed round led by Playground Global, this brings total funding to $39.5m.

PicoJool will use the funding to expand its teams and facilities in the USA and Taiwan as it brings its vertical-cavity surface-emitting laser (VCSEL) and optical link products to market. The firm plans to grow its R&D, operations, sales and marketing organizations while building the capacity needed to qualify, make and support its products for hyperscalers and data-center operators.

"Reaching 200G per lane proved that the performance is there. Our focus now is execution," says founder & CEO Al Yuen. "This funding allows us to expand our teams in the US and Taiwan, qualify products with customers and move a complete portfolio from chip-level VCSELs and micro-VCSELs into AOC [active optical cable] and NPO [near-packaged optics] modules," he adds. "We are building the connectivity platform customers will need for the next decade of AI infrastructure."

AI clusters are increasing both the number of processors in a system and the volume of data moving between them, placing growing pressure on interconnect performance and data-center power budgets. PicoJool is applying the cost and manufacturing advantages of VCSEL technology to a portfolio of optical connectivity products designed to scale from 800G to 1.6T, 3.2T and beyond. The company is also seeing growing customer interest in its micro-VCSEL products, including 50G NRZ configuration for optical compute interconnects and 64G NRZ/PAM4 configurations for PCIe 6.0-based NPO applications.



PicoJool's founder & CEO Al Yuen.

Picojool has started early sampling of its chip-level VCSEL products ahead of broader availability.

PicoJool's portfolio includes high-speed VCSEL (100G, 200G) products and lower-power micro-VCSEL (50G NRZ, 64G NRZ/PAM4) configurations. The micro-VCSEL platform uses a massively parallel architecture to increase aggregate bandwidth while reducing the energy required to move each bit of data, addressing a critical constraint for hyperscale AI systems.

"Moving data efficiently dictates how quickly and economically AI scales," notes Greg Waters, general partner at Socratic Partners. "PicoJool combines a proven team with a unique approach that brings VCSEL technology's cost and manufacturing advantages to AI-scale bandwidth and power needs," he comments. "They are poised to become a vital connectivity platform for next-generation data centers."

The Series A funding round follows June's unveiling of PicoJool's 200G VCSEL and micro-VCSEL product family for scale-up AI data centers. The 200G products exceed 37GHz of bandwidth, and the portfolio includes quad 100G, quad 200G and 32x50G NRZ micro-VCSEL configurations that give customers multiple paths to 1.6T connectivity based on their bandwidth, power and system requirements.

"The network is the AI, and connectivity is becoming one of the defining constraints on performance. The industry needs a solution that can increase bandwidth while sharply improving power and cost," notes Pat Gelsinger, general partner at Playground Global. "PicoJool brings together breakthrough VCSEL performance, deep systems expertise and a manufacturing base capable of supporting tremendous scale," he comments. "The team is well positioned to move quickly from an important technical milestone to products that can reshape how AI infrastructure moves data."

PicoJool is working with Taiwan-based WIN Semiconductor and other gallium arsenide (GaAs) foundries to ready its 200G VCSELs for production. WIN has shipped over 1 billion chips over the past decade, bringing significant high-volume manufacturing experience to this work as PicoJool prepares its products for qualification and production. It is also working with system firms and hyperscalers to define next-generation pluggable, NPO and co-packaged optics (CPO) solutions.

www.picojool.com

Sivers investing $30m to boost Glasgow InP CW DFB laser manufacturing capacity to over 100 million annually

Expansion to support customer ramps for AI data center infrastructure

Sivers Semiconductors AB of Kista, Sweden (which supplies RF beamformer ICs and lasers for AI datacenter, SATCOM, defense and telecom applications) has announced a $30m strategic investment to significantly expand its indium phosphide manufacturing facility in Glasgow, Scotland, UK as it prepares for anticipated customer production ramps driven by growing AI data-center and optical networking demand.

The expanded facility is expected to support annual production of more than 100 million continuous wave (CW) distributed feedback (DFB) lasers, while adding new process capabilities, increased automation and greater manufacturing flexibility. The expansion program will begin in second-half 2026 and is expected to become operational in fourth-quarter 2027.

The investment marks an important step in Sivers' transition from a fab-lite manufacturing model to a hybrid manufacturing strategy, combining expanded in-house manufacturing capabilities with strategic foundry, packaging and manufacturing partners.

"The scale of today's AI infrastructure build-out is creating unprecedented demand across the optical supply chain," says Sivers Semiconductors' president & CEO Vickram Vathulya. "Our customers need significantly more laser production capacity and, just as importantly, the confidence that supply will be there when their programs ramp. This investment positions us, along with our foundry partners, to meet that demand."

As hyperscale operators build larger AI clusters and move toward higher-speed networking architectures, demand for advanced optical interconnect technologies is accelerating. Sivers believes that InP-based lasers and semiconductor optical amplifiers (SOAs) will play an increasingly important role in enabling the high-performance, energy-efficient optical connectivity required by these systems.

The investment reflects increasing customer engagement across AI data-center and advanced optical interconnect applications and is designed to ensure that manufacturing capacity is available as customer programs advance toward volume production.

"Scaling photonics for AI infrastructure requires more than increasing capacity. It requires a manufacturing strategy built for flexibility, quality and long-term customer demand," says chief operating officer Neeraj Chopra. "By combining our planned expansion in Glasgow with the manufacturing capacity of our external foundry partners, we can scale efficiently while maintaining the supply flexibility our customers need. This approach gives Sivers the ability to support high-volume production as AI infrastructure deployments accelerate."

The Glasgow expansion will complement Sivers' broader manufacturing ecosystem, including foundry, packaging and manufacturing partners in Asia. This hybrid manufacturing approach is designed to provide greater production scalability, geographic flexibility and supply chain resilience while maintaining strategic in-house manufacturing capabilities for Sivers' core photonics technologies.

Sivers makes changes to senior leadership team

Sivers has announced a series of senior leadership changes across its Wireless and Photonics businesses as it moves into its next phase of commercial growth.

Marc Pegulu joins as managing director of Wireless. He has more than 25 years of experience in delivering profitable growth of product businesses across RF, wireless and mixed-signal technologies. His past assignments include P&L leadership roles at Semtech and Qorvo that span multiple market segments and geographies of interest to Sivers.

Harish Krishnaswamy, managing director of Wireless and co-founder of MixComm (bought by Sivers in 2021) becomes chief strategy officer (CSO). He will focus on corporate strategy, M&A and new business initiatives, building on his experience in technology development and business development at Sivers.

David Clark joins as VP of engineering for Photonics, effective 31 October. He has over25 years of experience across photonics, semiconductor packaging, engineering management, product marketing and product line leadership. His career includes roles at Agilent, Leica Microsystems and FlipChip International, and more than 12 years at Amkor Technology, where he worked on the commercialization and production ramps of advanced packaging technologies and R&D programs.

Andrew McKee, chief technology officer of Photonics and co-founder of CST Global (bought by Sivers in 2017), is retiring from the firm. He will support the transition to David Clark through to the end of 2026.

"We have built a strong foundation of technology and products across wireless and photonics, and our focus now is on turning that foundation into commercial growth and scale," says president & CEO Vickram Vathulya.

www.sivers-semiconductors.com

Vector Photonics exhibits at ECOC 2026

Firm discusses how PCSEL technology can solve AI data-center bottlenecks

Vector Photonics Ltd of the West of Scotland Science Park — which was spun off from the University of Glasgow in 2020, and is pioneering the use of photonic crystal surface-emitting lasers (PCSEL) in secure communications — exhibited at the European Conference on Optical Communication (ECOC 2026) in Malaga, Spain (20–24 September). The company discussed how its proven PCSEL technology can eliminate communications bottlenecks in AI data centers that are threatening to restrict performance.

"Optical interconnect performance will determine the future of AI system scaling, making the laser a critical component," says CEO Dr Richard Taylor. "Without a new laser platform, AI networking will become the critical bottleneck," he adds. "PCSELs outperform other lasers when it comes to brightness, beam quality, packaging, testing and scalability, and are therefore well positioned as the optical communications technology of choice for AI and data centers."

Compared to other laser architectures including vertical-cavity surface-emitting lasers (VCSELs) and distributed feedback (DFB) lasers, PCSELs can possess key advantages to scalability, modulation, interconnect reach, and channel scaling, allowing them to overcome challenges of the incumbent technology, says the firm. PCSELs create a single platform that simplifies supply chains and gives data-center operators a more efficient and scalable solution as demand for data continues to grow, it adds.

PCSELs are also an enabling technology for other growth sectors such as free-space optical communications (FSOC) and light detection & ranging (LiDAR). Earlier this year, Vector Photonics became the first company to demonstrate free-space optical communications using PCSELs outside the lab. The firm is now positioning to scale-up its technology for industrial and commercial deployment.

www.ecoc2026.org
www.vectorphotonics.co.uk

Sumitomo Chemical Advanced Technologies to provide epiwafers for Aeluma

Partnership to accelerate development, qualification and production of photonics products for AI datacoms

Aeluma Inc of Goleta, CA, USA (which specializes in high-performance, scalable technologies for AI, mobile and consumer, defense & aerospace, and quantum) has executed an agreement with Sumitomo Chemical Advanced Technologies of Phoenix, AZ, USA (SCAT, a subsidiary of Japan's Sumitomo Chemical Co Ltd) to accelerate development and production of photonics wafers for the AI datacom market. The agreement will initially leverage existing metal-organic chemical vapor deposition (MOCVD) capabilities at SCAT's manufacturing facility, and provides a path for increasing capacity in the future.

Aeluma's large-diameter non-indium phosphide (non-InP) photonics platform combines what is claimed to be best-in-class materials with mass-market microelectronics manufacturing. With InP substrates in short supply, and geopolitics adding risk and uncertainty, alternative approaches are being considered to meet the demand for high-performance photonics components such as photodetectors and lasers. Traditional InP manufacturing is carried out on 100mm substrates and smaller. While 150mm InP lines are being established, new fabs require time and resources to qualify, and InP substrates are expensive and in short supply, notes Aeluma.

The heterogeneous integration method leverages non-InP substrates such as 150mm gallium arsenide (GaAs) and 200–300mm silicon (Si) that are more readily available. As well as the partnership with SCAT, Aeluma complements its in-house MOCVD capabilities by working with established large-volume GaAs and Si foundries for component fabrication, eliminating dependence on new fab buildouts and associated qualification timelines.

SCAT produces epitaxial wafers at its facility in Phoenix for the optical communications, smartphone, wireless and automotive industries.

"SCAT is an ideal partner to pair with Aeluma's in-house MOCVD that is capable of producing wafers of any size, including large-diameter 150mm, 200mm and 300mm substrates," comments Aeluma's founder & CEO Jonathan Klamkin Ph.D. "We have been working with SCAT for several years. This new agreement aims to strengthen our relationship and set the stage for accelerated development, qualification, production, and future potential expansion," he adds.

"The demand for epitaxial wafers for photodetectors and lasers has grown significantly, but InP substrate supply is limiting development and production efforts," notes SCAT's president & executive officer Dr Ken Campman. "Aeluma's technology is a promising solution for the datacom market and may impact other markets as well."

www.sumichem-at.com
www.aeluma.com

Ayar Labs expands 2026 funding to $650m to scale manufacturing-ready CPO for AI scale-up beyond rack

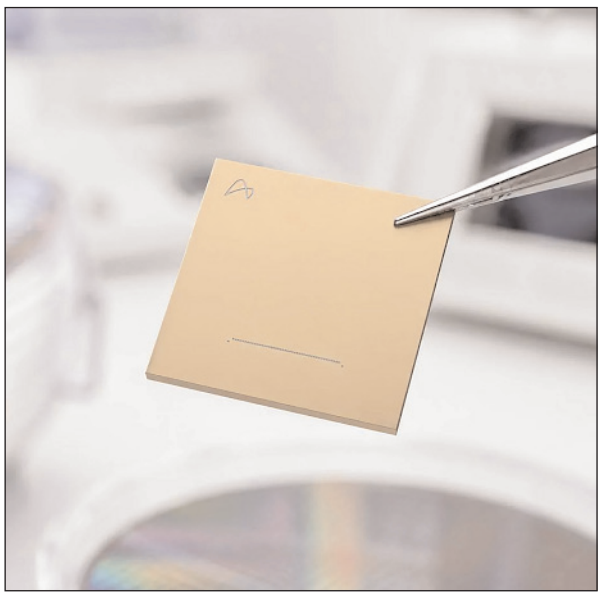
Extra $150m supports product development, manufacturing ecosystem readiness, high-volume production, and new Bengaluru Design Center

Silicon photonics-based chip-to-chip optical connectivity firm Ayar Labs of San Jose, CA, USA — which is pioneering co-packaged optics (CPO) for AI scale-up — has secured an additional $150m in funding, bringing its total primary capital raised in 2026 to $650m. Separately, it discloses that Wiwynn made a strategic investment earlier this year. Wiwynn, a cloud IT and infrastructure provider for data centers, joins a growing group of strategic backers that includes Alchip, AMD, Intel, MediaTek, and NVIDIA.

The new capital will support Ayar Labs' continued transition to high-volume manufacturing, including investments in product development, validation, scaling the manufacturing ecosystem, and opening a new Bengaluru Design Center. The firm says that it continues to establish deep integration across the semiconductor manufacturing and engineering ecosystem to deliver the highest-performing and manufacturing-ready CPO solution for AI scale-up.

"Copper interconnect is becoming the limiting factor for AI scale-up," notes CEO & co-founder Mark Wade. "This funding allows us to move faster on manufacturing-ready co-packaged optics at scale. We're deepening our work across the foundry and packaging ecosystem and growing our engineering capacity to support customer programs worldwide."

As AI systems scale from single accelerators to multi-rack architectures, performance is increasingly restricted by the power and physical constraints of electrical I/O. Ayar Labs says that its CPO solutions bring high-bandwidth, energy-efficient connectivity closer to compute, enabling system architects to extend AI scale-up while reducing the power and complexity that comes with copper interconnects.



AyarLabs' TeraPHY optical engine.

"Co-packaged optics is a foundational technology for the next generation of AI and cloud data centers," says William Lin, president & CEO of Wiwynn. "Through our collaboration and investment with Ayar Labs, we see a clear path to new architectures that reduce the power and complexity limits of copper interconnects, powering rack-scale deployment for the next wave of hyperscale AI data centers."

As part of its growth strategy, Ayar Labs is expanding its worldwide engineering presence with a new Bengaluru Design Center. This engineering hub will complement existing teams in the USA and Hsinchu, Taiwan. The firm's VP of silicon engineering Sankara Venkateswaran, hired earlier in 2026, is overseeing the new office, with senior director of engineering Arun Balachandar serving as site lead. The new India Design Center team will build end-to-end engineering capabilities across silicon product development.

"Our new Bengaluru Design Center supports our transition from technology development to commercialization and production," says Venkateswaran. "As customer demand and the complexity of our product roadmap increase, expanding our global engineering capacity will help us execute faster, support multiple development programs, and collaborate more closely with partners and customers across the region."

Ayar Labs is rapidly hiring to meet the immediate demand for co-packaged optics. A complete list of open roles in San Jose, Hsinchu and Bengaluru can be seen at ayarlabs.com/careers.

www.ayarlabs.com

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NewPhotonics and Tower begin high-volume shipments of laser-integrated, serviceable optical engine PICs for scale-out and scale-up AI interconnect

800G to 1.6T PICs in external pluggable and CPX MSA-compliant NPO socket pluggable solutions based on PH18DA platform

Specialty analog foundry Tower Semiconductor Ltd of Migdal Haemek, Israel and Tel Aviv-based fabless photonic integrated circuit (PIC) chip firm NewPhotonics Ltd have announced high-volume shipment of laser-integrated serviceable optical engines designed to meet the urgent and growing demand for high-bandwidth, energy-efficient optical interconnects in artificial intelligence infrastructure.

The PIC optical engine chips support OEM solutions ranging from FRO/LRO/LPO and Extra-Dense Packaged Optics (XPO) pluggable transceiver modules and near-packaged optics (NPO) socket pluggable applications. Volume production PICs that are shipping now currently support data rates from 800G to 1.6T, with future volume manufacturing planned at 6.4T NPO solutions suitable for scale-out and scale-up architectures.

The collaboration leverages the high-volume PH18DA silicon photonics (SiPho) technology platform featuring heterogeneously integrated indium phosphide (InP) components enabling monolithic integration of lasers, semiconductor optical amplifiers (SOAs), modulators, and photodetectors on a single photonic integrated circuit. This highly integrated, optical-domain focused approach is said to reduce complexity and manufacturing variability to supply better yield, reliability, and time-to-market with a leading-edge photonic device.

Volume shipment of NewPhotonics' NPG102 PIC products for 800G and 1.6T feature 200G-per-lane designs and heterogeneously integrated lasers on a monolithic PIC enables customers to leverage optical signal processing in a unified architecture that delivers power efficiency, bandwidth density, and manufacturing consistency. The CPX-MSA-compliant NPC505 chipsets for 6.4T will begin volume shipment in first-half 2027.

"The next phase of AI infrastructure demands optical connectivity that scales in both production and performance," says NewPhotonics' senior VP & general manager Doron Tal. "With Tower, we are translating laser-integrated photonics into a practical choice and volume availability. By combining our optical chip design with their manufacturing platform, we are first to bring higher-bandwidth, energy-efficient highly integrated systems to the OEM customer and data-center market," he adds.

"We are excited to see our vision of integrating lasers with high-performance photonic integrated circuits come to fruition through scale-ready solutions optimized for FRO/LRO and NPO architectures," says Dr Ed Preisler, VP & general manager of Tower's RF business unit. "NewPhotonics is a valued partner and the first to bring heterogenous laser-integrated optical engines on the PH18DA platform into high-volume production, marking an important milestone in scaling optical connectivity for next-generation AI infrastructure."

Both companies participated in the European Conference on Optical Communications (ECOC 2026) exhibition in Málaga, Spain (21–23 September), with representatives available for meetings during the event.

www.ecocexhibition.com
www.newphotonics.com
www.towersemi.com/technology/rf

Tower highlighting high-volume silicon photonics and SiGe solutions at ECOC

Firm targeting AI infrastructure, telecom and emerging applications

At the European Conference on Optical Communications (ECOC 2026) exhibition in Málaga, Spain (21–23 September), Tower Semiconductor representatives were available for meetings to discuss current and future silicon photonics roadmap.

Tower showcased its high-volume and high-performance silicon photonics platform, which is utilized across the industry for data-center and telecom optical transceivers, and for high-growth applications, including near- and co-packaged optics (NPO/CPO) for next-generation AI cluster architectures, DWDM lasers, optical circuit switching, FMCW LiDAR for physical AI, and quantum computing.

The company also featured its silicon germanium (SiGe) BiCMOS solutions, which complement its SiPho platform to address the higher-bandwidth, lower-latency and lower-power demands of next-generation AI infrastructure.

www.ecocexhibition.com
www.towersemi.com/technology/rf-and-hpa

Coherent shows optical innovations to scale AI infrastructure

At the European Conference on Optical Communications (ECOC 2026) in Málaga, Spain (21–23 September), materials, networking and laser technology firm Coherent Corp of Saxonburg, PA, USA announced new optical technologies and gave live demonstrations designed to help customers scale AI infrastructure.

Coherent showcased innovations spanning AI datacenter connectivity, co-packaged optics (CPO) and near-packaged optics (NPO), next-generation pluggable transceivers, optical transport, specialty fibers, optical circuit switching, advanced materials, and thermal management addressing rising power density.

Featured technology demonstrations

Coherent's demonstrations showed how its vertical integration across materials, devices, components, modules and systems supports different AI connectivity architectures including scale-across, scale-out, scale-up and chip to chip. Highlights include:

- 3.2T 2xDR4 Transceiver in an OSFP-Size Package

Coherent demonstrated a compact 3.2T pluggable architecture with dual 1.6T optical paths in an OSFP-size package. The technology demonstration incorporated eight 425G PAM4 line-side optical lanes, Coherent Differential EMLs and Coherent photodiodes, highlighting progress toward next-generation 400G-per-lane optical connectivity.

- 6.4T NPO Optical Engine

A 6.4T NPO demonstration showcased a compact and power-efficient optical engine for high-density AI scale-up and scale-out fabrics. The demonstration brought together silicon photonics, fiber attach technology, ELSFPs, and Coherent laser technology to illustrate the advantages of vertical integration across critical optical interfaces.

- VCSEL-based optics for AI scale-up

Coherent demonstrated high-density 2D VCSEL and photodiode arrays for highly parallel optical architectures in CPO and NPO low latency connectivity.

- Full C-band pluggable optical line system

For DCI and Scale-Across applications, Coherent showcased its LS200 full C-band pluggable optical line system for datacenter interconnect and transport applications. The compact architecture brings pluggable line-system functionality closer to the router or switch while supporting flexible point-to-point optical transport.

Optical components, assemblies and modules

Coherent also showcased new products and emerging technologies across its optical networking portfolio, including:

- FlexConnect

A detachable fiber array unit connector for CPO applications designed to simplify assembly and maintenance, with repeatable plug-unplug performance, interchangeability and an epoxy-free optical path compatible with high-power lasers.

- OptiAlign

A high-precision fiber array unit for CPO applications designed to support precise pitch control and high fiber-channel counts. Coherent combines an internally developed V-groove with customized fiber dimensions to address demanding optical alignment requirements.

- OptiFocus

A two-in-one coupling lens design for ELS, intended to simplify optical assembly while providing high coupling efficiency.

- FiberPack

A passive fiber assembly kit for scale-up and scale-out architectures that integrates fiber attach, micro-lens, tray, and termination technologies, drawing on Coherent's vertically integrated optical-components manufacturing.

- OptiPolar Array X

A multi-channel Polarization Beam Splitter Array in a super-compact form factor based on glass material optimized for multi-lane systems.

- 2D micro-VCSEL and PD array

High Density 2D Array of individually addressable emitters and PD array with integrated lenses designed for flip chip bonding in NPO or CPO architectures.

- Specialty Fibers

Tight geometry-controlled Polarization Maintaining Fiber; Mode-Matched Fiber for improved coupling efficiency into edge-coupled silicon photonics; and multi-core fiber for high-density AI data-center solutions.

- Ultra-High-Power (UHP) CW laser

Enabled by a proprietary design and advanced manufacturing processes, this ultra-high-power continuous-wave (CW) laser delivers high spectral stability, narrow linewidth, and low relative intensity noise (RIN) across its full operating range.

- Pluggable Optical Line System (POLS)

A full C-band optical line system with a high-power, variable-gain amplifier in a compact QSFP form factor. Designed for 800G ZR/ZR+ digital coherent optics, it supports up to 32 DWDM wavelengths over a single fiber pair, carrying up to 25.6Tbps across links from 2km to 200km.

Thermal management for high-density AI infrastructure

Coherent also showcased Thermadite materials, diamond-based solutions and other advanced materials and components designed to address the growing power density and cooling requirements of AI infrastructure.

Partner and quantum technology demonstrations

Coherent participated in OIF interoperability and, separately, demonstrate quantum technologies for networking and encryption applications with industry partners.

With Quside, Coherent will demonstrate quantum random number generation for encryption applications using live quantum entropy alongside Coherent optical connectivity. With CUbIQ, Coherent will participate in a quantum key distribution demonstration in a compact pluggable architecture.

Industry thought leadership
Coherent executives and experts contributed to Market Focus sessions and the ECOC technical program, covering AI data-center infrastructure, CPO, optical interconnect scaling, advanced materials, coherent-lite optics and satellite connectivity.

Market focus
- 'Cooling Smarter: How Advanced Materials Unlock Datacenter Efficiency'. Speaker: Dr Sanjai Parthasarathi.
- Panel: Modules and Subsystems Co-Chair: Dr Sanjai Parthasarathi.
- 'Beyond 1.6T: Enabling AI Datacenter Scale with Coherent-Lite Optics'. Speaker: Shawn Esser.
- 'Scaling the Optical Future: Technologies Enabling Scale-Up, Scale-Out and Scale-Across AI Infrastructure'. Speaker: Dr Julie Sheridan Eng.
- 'Co-Packaged Optics: From Industry Promise to Reality'. Speaker: Justin Abbott.
- Fireside Chat on the Increasing Role of Photonics in Next-Generation AI/ML Interconnects. Speaker: Dr Giovanni Barbarossa.
- Panel: 'Realistic Check of AI Interconnect Scaling Solutions for the Post-1.6T Era'. Panelist: Dr. Sanjai Parthasarathi.
- 'Scaling Ground Station Connectivity for Satellite Constellations'. Speaker: Jessica Wang.

ECOC conference
- Workshop: 'Light Sources for Next-Generation Optical Communication Systems for AI Datacenters'. Organizer: Dr Wilfried Maineult.
- Workshop: 'Hybrid Solutions for Very High Speed PON — the best (or worst) of coherent and IMDD worlds'. Speaker: Dr Noriaki Kaneda.
- Workshop: 'Can Fast Narrow Channels Keep Rising Without Limit or Will Slow and Wide Become the Winner?'. Speaker: Dr Chris Kocot.
- Poster Presentation: 'PAM4 448 Gb/s per Lane InP MZM-SOA Array PIC for Next-Generation CPO'. Speaker: Dr Anna Tatarczak.
- Public Presentation: '2.3 Tbit/s Backside-Emitting 1060 nm VCSEL Array on Silicon Interposer for CPO Applications'. Speaker: Dr Marc Ganzhorn.
- Technical Session: 'Novel Modulators: Discrete Photonic Devices and Technologies'. Chair: Dr Wilfried Maineult.

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Coherent launches PhotonLink integrated optics platform for AI infrastructure

Critical photonics technologies combined with end-to-end assembly and test to deliver complete optical solutions for next-gen data centers

Coherent has launched PhotonLink, an integrated optics platform that brings together Coherent's broad portfolio of critical photonics technologies, precision assembly and test capabilities to deliver complete optical solutions for next-generation AI data centers. The platform supports co-packaged optics (CPO), near-packaged optics (NPO) and emerging chip-to-chip connectivity.

As AI systems continue to scale, demand for higher bandwidth and lower power is driving optical connectivity closer to compute and switching silicon. These architectures require lasers, silicon photonics, precision optics, fibers and detectors to work together. PhotonLink brings those technologies and the expertise to integrate them into one platform.

"The next leap in AI requires more than faster chips – it requires a new way to connect them," says CEO Jim Anderson. "Customers need complete optical solutions, not just individual components. Coherent is uniquely positioned to bring together the critical technologies, integrate and test the finished assemblies, and manufacture them at scale," he claims. "PhotonLink puts that capability to work for the next generation of AI infrastructure."

Coherent's vertical integration spans compound semiconductor materials, lasers, optics and specialty fiber through final assembly and test. PhotonLink gives customers access to both individual components and complete optical assemblies from one partner, helping to simplify system design, streamline qualification and reduce the complexity of integrating technologies from multiple suppliers.

From critical technologies to complete optical assemblies
The PhotonLink platform spans four functions of the optical path: Generate, Shape, Guide and Receive. The portfolio includes indium phosphide (InP) lasers, vertical-cavity surface-emitting laser (VCSEL) arrays, silicon photonics, isolators, specialty fibers, micro-optics and detectors. Coherent integrates these technologies into external laser sources, precision fiber assemblies and optical modules tailored to customer architectures.

Customer engagement and manufacturing scale
Coherent says it has more than ten CPO customer engagements and more than ten NPO engagements, with anchor customers and long-term agreements secured for both architectures. It also has more than five engagements in emerging chip-to-chip connectivity. Revenue from PhotonLink is expected to start ramping in fourth-quarter 2026.

PhotonLink builds on Coherent's established data-center manufacturing base, which has shipped over 300 million InP lasers and over 1 billion InP and gallium arsenide (GaAs) photodetectors. Coherent is expanding its 6" InP and specialty fiber manufacturing capacity to support the PhotonLink ramp.

www.coherent.com/datacenter-communications/photonlink

Lumentum, Qualcomm and Corning demonstrate high-density 1060nm VCSEL optical D2D connectivity for AI scale-up at ECOC

Joint demo showcases massively parallel optical die-to-die architecture for extending high-bandwidth, low-power, low-latency connectivity over multimode fiber

At the European Conference on Optical Communications (ECOC 2026) in Málaga, Spain (21–23 September), 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 a joint demonstration together with Qualcomm Technologies Inc (a subsidiary of Qualcomm Inc of San Diego, CA, USA) and Corning Inc of a high-density die-to-die (D2D) optical interconnect showcase for AI scale-up architectures. The board-level demonstration combined a D2D interface IP subsystem from Qualcomm Technologies with Lumentum's VCSEL-based optical interconnect platform and Corning multimode fiber connectivity.

The demonstration showcased a massively parallel optical D2D architecture designed for future co-packaged optics (CPO) and near-packaged optics (NPO) implementations supporting emerging D2D interfaces such as UCIe. By extending high-density D2D connectivity over optical links spanning tens of meters — while maintaining low latency and power consumption — the architecture enables highly scalable bandwidth density as AI systems drive interconnect requirements beyond the practical limits of today's electrical connectivity.

Qualcomm Technologies' D2D interface technology is designed to optimize power and area while enabling efficient direct-drive optical connectivity and preserving the benefits of high bandwidth density and low power. The proof-of-concept configuration being demonstrated uses optical channels operating at 32Gb/s NRZ, to show how the massively parallel architecture can scale through higher channel counts and increasing per-lane data rates. The architecture is designed to support about 1Tb/s/mm of shoreline bandwidth density now, with line of sight to about 4Tb/s/mm through higher lane rates and increased channel density.

By combining advanced VCSEL packaging with Qualcomm Technologies' D2D interface technology and Corning's fiber connectivity, we are showing a practical path toward compact, energy-efficient optical D2D links for next-generation AI scale-up architectures

The optical interconnect leverages Lumentum's optica engine based on advanced-packaged 1060nm VCSEL technology, with about 10Tb/s of aggregate transmit and receive capacity and high-density two-dimensional VCSEL and photodetector arrays with backside lens technology. Built on Lumentum's ultra-high-volume 3D sensing manufacturing base, the platform is designed to support high shoreline bandwidth density, strong signal integrity, and energy-efficient optical connectivity for board-level and system-level AI scale-up architectures.

Corning's multimode fiber glass ferrules will provide the high-density fiber connectivity used in the demonstration, highlighting the importance of fiber density as optical links increasingly move closer to compute devices and advanced packaging environments.

"This demonstration shows how Lumentum's 1060nm VCSEL platform can bring high-density optical connectivity closer to AI compute," says Lumentum's chief technology officer Matt Sysak. "By combining advanced VCSEL packaging with Qualcomm Technologies' D2D interface technology and Corning's fiber connectivity, we are showing a practical path toward compact, energy-efficient optical D2D links for next-generation AI scale-up architectures," he adds.

"AI scale-up requires die-to-die connectivity that delivers high bandwidth density while minimizing latency, power, and area," says Tony Chan Carusone, senior VP, technology, at Qualcomm Technologies. "This collaboration shows how Qualcomm Technologies' D2D interface technology can extend those capabilities into optical links for future AI system architectures," he adds.

"As optical links move closer to compute devices, fiber connectivity must support increasing density, precision, and scalability," says Claude Echahamian, VP & general manager, emerging businesses and EMEA, Corning Optical Communications. "Corning's multimode fiber solutions and industry-leading MMC connectivity help enable this demonstration and support the evolution of high-density optical interconnects for AI infrastructure."

www.ecocexhibition.com
www.corning.com
www.qualcomm.com
www.lumentum.com

Lumentum demos DWDM ELSFP module for OCI MSA

Eight-wavelength DWDM laser enables compact, serviceable, external light source for next-gen CPO and NPO AI interconnects

At the European Conference on Optical Communications (ECOC 2026) in Málaga, Spain (21–23 September), Lumentum demonstrated an eight-wavelength dense wavelength division multiplexing (DWDM) laser module in an external laser small-form-factor pluggable (ELSFP). The module incorporates an optical interface designed to meet the applicable requirements of the Optical Compute Interconnect Multi-Source Agreement (OCI MSA). It is aimed at external laser source applications in co-packaged optics (CPO) and near-packaged optics (NPO) architectures.

As AI systems drive higher bandwidth and port densities, CPO and NPO architectures bring optical engines closer to switch and accelerator packages to reduce the electrical distance between SerDes and optics. An external laser source separates the laser from the highest-temperature environment, while a pluggable ELSFP module can be accessed, serviced or replaced independently of the compute or switching package. DWDM-based architectures can further increase bandwidth density where package-edge space and fiber routing are constrained.

The ELSFP module provides eight simultaneous DWDM wavelengths across two four-channel bands centered near 1311nm and 1331nm. The design targets wavelength accuracy of ±0.2nm and demonstrates up to 24dBm (~250mW) of optical output power per wavelength at the fiber. All eight channels operate simultaneously from a single, pluggable module with about 12W of power consumption. The module utilizes Lumentum's Ultra High Power (UHP) laser platform, already in production, in an eight-channel configuration with performance aligned to applicable OCI MSA requirements.

The demonstration reflects the growing need for compact, standards-based laser sources as data-center architectures move toward CPO and NPO to meet the bandwidth and power demands of AI scale-up infrastructure. Lumentum expects initial availability of the DWDM ELSFP module with an OCI MSA optical interface in first-half 2027.

"CPO and NPO are becoming defining architectures for AI scale-up, and external laser sources are a critical building block of that shift," says Sri Venkat, senior VP & general manager of components. "This demonstration shows our progress toward a standards-based DWDM ELSFP module, positioning Lumentum to serve customers as the CPO/NPO market scales," he adds.

In addition to the ELSFP module demonstration, Lumentum showcased a scale-across networking display featuring products for high-capacity inter-data-center connectivity. The Lumentum OCS R300 optical circuit switch was also exhibited, highlighting the firm's optical switching portfolio for scalable AI infrastructure.

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www.lumentum.com

Optica i4 Individual Achievement Prize for president & CEO

At the Global Photonics Economic Forum 2026 in Málaga, Spain on 24 September, Lumentum's president & CEO Michael Hurlston was presented with the 2026 Optica i4 Individual Achievement Prize, recognizing his leadership and contributions to the global optics and photonics industry.

Optica (the global society dedicated to advancing optics and photonics worldwide) says the i4 Prize honors individuals and organizations whose achievements reflect Optica's core values of 'Innovation, Integrity, Inclusion, and Impact'. The award recognizes leaders who have made lasting contributions to the optics and photonics community through their vision, leadership and commitment to advancing the field.

Hurlston was selected from more than 30 nominations submitted by leaders across the global optics and photonics community. The recipient was chosen by the 2026 Optica i4 Prize Jury, composed of members of the Optica Corporate Engagement Council: Reinhard Voelkel (chair); Michael Lebby (past chair); Aleksandra Boskovic; Simon Schwinger; Joseph Spilman; and Natarajan Subrahmanyan.

"Michael Hurlston embodies the values that the Optica i4 Prize was created to recognize," comments Optica's chief technology officer Jose Pozo. "He has successfully combined technological vision with business leadership, helping drive innovation while creating value for customers, employees, shareholders, and the broader photonics community."

Since becoming president & CEO in February 2025, Hurlston has led Lumentum through a period of significant growth. Lumentum says that it has strengthened its position as a leading provider of optical and photonic technologies serving cloud and AI infrastructure, communications networks, industrial applications, and advanced sensing markets.

www.optica.org/events/industry_events/2026/global_photonics_economic_forum
www.lumentum.com

OIF releases critical 1600ZR Coherent Interface IA, doubling capacity per wavelength for data-center interconnects

New Implementation Agreement defines interoperable 1.6T coherent line interface for amplified DWDM links up to 120km

The Optical Internetworking Forum (OIF) has issued the Implementation Agreement (IA) for 1600ZR Coherent Interfaces, defining an interoperable 1.6T coherent line interface and frame format for single-span, amplified, point-to-point dense wavelength division multiplexing (DWDM) links up to 120km.

The IA doubles the capacity of OIF's 800ZR specification, enabling a single 1.6T Ethernet client to be transported over a single coherent wavelength. It represents the next major step in OIF's ZR evolution and provides the common technical foundation needed to bring interoperable 1.6T coherent solutions to data-center interconnect applications.

AI training, inference and cloud workloads are driving rapid expansion within and between data centers, creating an urgent need for greater capacity without corresponding increases in power, cost or physical footprint. By combining 1.6T transmission, DCI-class reach and client-optics-equivalent port density, 1600ZR addresses each of these requirements within a framework designed for multi-vendor implementation.

"1600ZR is a defining milestone for coherent networking," says Karl Gass, OIF Physical & Link Layer Working Group Optical Vice Chair. "It doubles the capacity of 800ZR while preserving the reach, interoperability and client-like density that have made the ZR ecosystem so fundamental. As the AI scale-across application drives unprecedented growth in traffic between data centers, the industry cannot solve the challenge with capacity alone. This IA aligns the ecosystem around a practical 1.6T interface and gives vendors and operators a common foundation for the next generation of coherent DCI."

Building on the success of OIF ZR

OIF's ZR work has played a central role in moving coherent optics from traditional transport systems directly into routers and switches. Like 400ZR and 800ZR before it, the new 1600ZR IA was developed through a systematic process driven by OIF's network operator and vendor members. It enables Ethernet client interfaces to be transmitted over a single coherent line interface by specifying the client mapping, frame format, forward-error correction (FEC), modulation, and optical characteristics needed for interoperable implementations.

"1600ZR continues the trajectory OIF set with 400ZR, which fundamentally changed how coherent optics could be deployed," says Ian Betty, OIF board member (Ciena). "The work within OIF has consistently anticipated where networks need to go next, bringing together the technical expertise needed to turn ambitious requirements into practical, interoperable solutions. Delivering 1.6T over a single wavelength marks another major step forward — and provides a critical building block for the AI infrastructure now being deployed."

OIF members demonstrated multi-vendor ZR interoperability at the European Conference on Optical Communication (ECOC 2026) in Málaga, Spain (21–23 September). The live demonstration brought together coherent implementations from across the ecosystem, providing a practical view of the specification's impact.

www.ecocexhibition.com
www.oiforum.com/wp-content/uploads/OIF-1600ZR-01.0.pdf

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VLC Photonics completes transfer of PIC testing and assembly operations to new facility

Phased relocation began with transfer of non-technical teams in November 2025

Fabless photonic integrated circuit (PIC) design, prototyping, testing and packaging house VLC Photonics S.L. of Valencia, Spain (a Hitachi Group company that has experience with material platforms including silicon photonics, indium phosphide, silicon nitride, PLC and polymer) has completed the transfer of its PIC testing & assembly operations to its new headquarters at the Táctica Industrial Park in Paterna, Valencia. The move concludes a phased relocation that began with the transfer of its non-technical teams to the new offices in November 2025.

The new facility spans 1545m^2 (16,600ft^2), consisting of 315m^2 of cleanroom space, 480m^2 of laboratories, and 750m^2 of offices. The cleanroom is certified to ISO Class 7 (Class 10,000) with full ESD protection, and the R&D characterization is performed in an adjacent ISO Class 8 laboratory. All testing, assembly and metrology equipment and instrumentation are now installed and operating at the new site.

Purpose-built infrastructure for PIC test and assembly

The relocated infrastructure supports the full range of characterization and test services that VLC Photonics offers to PIC developing companies, photonic foundries, system integrators, and research organizations:

- Wafer-level testing with fully automated probe alignment at nanometer precision, both for vertical and edge coupling through trenches, covering optical, electrical DC, and RF parameters.
- Die-level testing on both semi-automated and fully automated platforms, supporting edge and vertical grating coupling, with automated chip and fiber pick, place and attachment, and throughput exceeding 1000 dies per month.
- Packaged PIC testing for chip-on-board and chip-on-carrier assemblies.
- Electrical characterization up to 110GHz, with NRZ and PAM4 signal generation and real-time analysis at 256GSa/s for eye diagram and bit-error-rate evaluation.
- Optical characterization from 350nm to 4000nm, spanning visible, near-infrared, and mid-infrared wavelengths, including full polarization control.
- Assembly capabilities for test boards, including semi-automatic wire bonding, flip-chip attachment, fiber array attachment, and high-precision 2D/3D optical metrology.
- Reliability testing, including thermal test in a humidity-controlled climatic chamber for high-temperature operating life (HTOL), high-temperature storage (HTS), temperature cycling (TC), thermal shock (TS), damp heat/ 85°C-85%RH (THB), highly accelerated stress testing (HAST/uHAST).



VLC Photonics says that operating a dedicated, company-controlled environment allows it to schedule test campaigns independently, maintain full control over the confidentiality of customer samples and data within a single secured chain of custody, and allocate capacity from R&D toward low- and mid-volume test and assembly work as customer demand grows, with the possibility to transfer the processes to larger-volume partners in collaboration with Hitachi. The facility retains a built-in cleanroom expansion zone to accommodate further capacity without structural modification.

"Moving our labs is not something a test house does lightly, especially after having grown over 15 years on our previous location," says CEO Iñigo Artundo. "Completing the transfer with every system back in operation in record time is a credit to our engineering team. What matters to our customers is what it means: we now control our own environment end-to-end, which means we set the schedule, we protect the samples, and we can scale capacity as the market demands," he adds. "Photonic integration is moving from prototype volumes toward real production volumes, and this facility is how we help our customers reach there faster and more reliable, in a cost-effective way."

Founded in 2011 as a spin-off of the Universitat Politècnica de València (UPV), VLC Photonics still maintains, after the move, an active presence on the university high-tech campus for R&D collaborations, and with the local PIXEurope photonics pilot line.

VLC Photonics exhibited at the European Conference on Optical Communications (ECOC 2026) in Málaga, Spain (21–23 September).

www.ecocexhibition.com
www.hitachi-hightech.com/us
www.vlcphotonics.com/testing
www.vlcphotonics.com/assembly-

Senior executives from GlobalFoundries and STMicroelectronics join OpenLight

Kevin Soukup and Kirk Ouellette to aid scaling of silicon photonics platform for AI, cloud and advanced connectivity markets

Photonic application-specific integrated circuit (PASIC) chip designer and manufacturer OpenLight of Goleta, Santa Barbara, CA, USA (which launched as an independent company in 2022, introducing the first open silicon photonics platform with heterogeneously integrated III-V lasers, modulators, amplifiers and detectors) has made two additions to its executive leadership team: Kevin Soukup as chief operating officer and Kirk Ouellette as chief strategy officer & interim chief revenue officer.

Together, the appointments add senior leadership with direct experience of building, scaling and commercializing semiconductor and silicon photonics businesses at global scale. They come as OpenLight expands its technology platform and customer engagements across AI, cloud, networking, and advanced communications applications.

"OpenLight is entering a pivotal phase of growth as demand for high-performance optical technologies continues to accelerate," says CEO Adam Carter. "Kevin and Kirk bring deep operating experience that is directly aligned with where OpenLight is going. Their proven track records significantly strengthen our ability to execute for customers, broaden our commercial reach and expand our position in the market."

Kevin Soukup named chief operating officer

As chief operating officer, Soukup will lead operational strategy and execution across OpenLight, with a focus on scaling the technology platform, operating infrastructure and customer delivery capabilities.

He has experience across the full operating lifecycle of a semiconductor business, from strategy and technology investment through commercialization, operations, and scale.

At GlobalFoundries, Soukup was senior VP & general manager of its Silicon Photonics business, with responsibility for product strategy, technology roadmaps, commercial operations, and growth. Under his leadership, the business expanded significantly and established a leadership position in the growing silicon photonics market.

Prior to that, Soukup held executive roles across corporate strategy, finance, operations, and business transformation. He played a key role in GlobalFoundries' transformation into a profitable growth company and was part of the leadership team that guided the company through its successful initial public offering.

Soukup also serves as chairman of the board of VueReal, a leader in micro-LED technology.

"OpenLight has built a differentiated platform at a pivotal moment for silicon photonics," says Soukup. "The company has the technology, ecosystem and team to capture that opportunity. My focus will be on strengthening execution, scaling the operating model and ensuring we can support customers as adoption grows. I look forward to helping OpenLight operate at significantly greater scale and deliver even more value to customers and partners."

Kirk Ouellette named chief strategy officer & interim chief revenue officer

As chief strategy officer & interim chief revenue officer, Ouellette will lead OpenLight's corporate strategy, business development, market expansion and revenue growth initiatives.

He has more than 25 years of global semiconductor and photonics executive leadership experience across strategy, sales, marketing, product management, and business development. Throughout his career, he has built and managed semiconductor businesses exceeding $100m in revenue and has played a direct role in the development and commercialization of silicon photonics technologies worldwide.

Most recently, he served as VP of corporate strategy at STMicroelectronics, where he led initiatives spanning market and technology intelligence, strategic partnerships, mergers and acquisitions, and corporate growth.

Prior to that, Ouellette led photonics and advanced semiconductor businesses across Asia-Pacific for STMicroelectronics, driving substantial growth in custom silicon and photonics solutions and securing major silicon photonics programs with leading global technology companies.

He also serves as chair of the Canadian Semiconductor Council, supporting the development and competitiveness of North America's semiconductor ecosystem.

"OpenLight has built a unique technology platform that is enabling a new generation of photonic integrated circuits," comments Ouellette. "As AI and increasingly data-intensive computing architectures drive greater requirements for bandwidth, power efficiency and integration, the role of photonics is becoming more critical. OpenLight is exceptionally well positioned to address that demand, and I am excited to accelerate customer adoption, expand strategic relationships and grow the company's global market presence."

The appointments strengthen OpenLight's leadership across operations, strategy and commercialization as the company scales its platform and deepens engagement with global customers and partners.

www.openlightphotonics.com

SMART Photonics partners with GF to offer first open access foundry for integrated silicon and InP photonics

Collaboration to enable new optical products that benefit from both material platforms for AI, data centers, LiDAR and other applications

SMART Photonics B.V. has partnered with 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) to offer a new open access foundry service combining GF's scalable and production-proven silicon platform with SMART Photonics' high-volume indium phosphide (InP) photonic integrated circuits (PICs), including lasers and modulators. The first-of-its-kind commercial offering will enable designers to take advantage of these two photonics platforms to address scaling challenges for AI data centers and to provide an efficient production process for today's pluggable optical transceivers.

Founded in 2012 in cooperation with the Eindhoven University of Technology and headquartered at the High Tech Campus in Eindhoven, the Netherlands, SMART Photonics manufactures discrete and integrated photonic components.

GlobalFoundries provides an industry-proven, silicon-based cavity in which SMART Photonics' lasers and semiconductor optical amplifier (SOA) are integrated using flip-chip technology. For more than a year, the companies have done extensive co-engineering and development to meet the technical requirements of dimensional fit and efficient optical coupling. The resulting innovations in manufacturing techniques will enable product designers to reduce the footprint and costs of their chiplet products, as well as achieve faster time to market, say the firms.

"GlobalFoundries is a leader in silicon photonics with global reach and an extensive track record of manufacturing innovation," comments SMART Photonics' CEO Johan Feenstra. "The combination of their technology with SMART Photonics' leading indium phosphide-based PICs marks a significant milestone toward meeting the explosive market demand for power- and cost-efficient photonics products," he adds.

"Our customers seek active components seamlessly integrated into our silicon photonics platform," says Vikas Gupta, senior fellow, silicon photonics business at GF. "By partnering with SMART Photonics to deliver this new open access foundry service, we have created a highly efficient production process to accelerate the availability of high-performance integrated optical products."

General availability for the joint foundry service is targeted for second-half 2027.

www.gf.com
www.smartphotonics.nl

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US DOE announces $12m funding for space PVs

To accelerate technical innovation and expand domestic manufacturing for solar panels in space applications, the US Department of Energy's (DOE) Office of Critical Minerals and Energy Innovation has announced a $12m funding opportunity to ensure that the next generation of space photovoltaics is developed in the USA.

"The next frontier for solar PV power generation is in space," says Assistant Secretary of Energy Audrey Robertson. "This investment will establish American leadership in next-generation, space-based PV, bolster our national security, and enhance our economic competitiveness." The USA developed the first solar cells tailored for spacecraft and, in March 1958, launched the world's first solar-powered satellite.

Through the Space Photovoltaics Research and Development PIA (Partnership Intermediary Agreement) opportunity, the DOE and partnership intermediary TechWerx are seeking projects that address the following topic areas:

- Next-generation Cell Innovation (Topic 1): Projects will focus on the advancement of high-performance, low-cost and durable space-grade PV cells in the lab environment;
- Rapid Production and Demonstration (Topic 2): Projects will focus on advancing innovative, high-volume manufacturing processes and demonstrating third-party-validated performance of module prototypes in space or near-space environments.

The PIA opportunity will fund projects for up to three years. University and industry research laboratories developing space-applicable PV technologies or specializing in PV characterization and stress testing, as well as industry teams advancing near-commercial, pilot-scale space PV solutions with testing partnerships and the capability to fly PV prototypes or panels in space are encouraged to apply. Expected individual awards are up to $1.5m for Topic 1 and up to $2m for Topic 2. Applications must be submitted by 11:59pm ET on 8 October.

The Space PV R&D initiative is managed by TechWerx in partnership with DOE, a collaboration made possible through an innovative Partnership Intermediary Agreement set up by the DOE's Office of Technology Commercialization. This agreement enables TechWerx to broaden DOE's engagement with innovative organizations and non-traditional partners, facilitating the rapid development, scaling, and deployment of energy solutions.

www.techwerx.org/opportunities/IESO-SPACEPV
www.energy.gov/cmei/

Ascent expands commercial & defense industry expertise

Ascent Solar Technologies Inc of Thornton, CO, USA – which designs and makes lightweight, flexible copper indium gallium diselenide (CIGS) thin-film photovoltaic (PV) panels that can be integrated into consumer products, off-grid applications and aerospace applications – has added Tom Bawol as its new director of strategic sales & market development, and Lieutenant General Steve Smith to its Strategic Advisory Board as strategic advisor.

The appointments add decades of military leadership, strategic planning, operational management and business development experience to Ascent as it continues to expand the commercial reach of its thin-film PV technology within the space, defense, unmanned systems and other burgeoning markets.

Bawol joins after over 20 years of service as a leader in the US Army Special Forces, gaining experience leading complex operations, building partnerships and government, defense and commercial stakeholders. Recently, he expanded his experience in the private sector with roles in energy infrastructure and federal technology sales. His work has given him hands-on experience in identifying government customer requirements and developing strategies to translate emerging market needs into commercial growth opportunities.

Bawol will help to identify and develop new commercial opportunities for Ascent's thin-film PV technology. He will cultivate strategic relationships with prospective customers and partners to support the firm's continued expansion into markets in need of power generation capabilities that thrive in punishing conditions and environments.

Smith joins the Strategic Advisory Board following a distinguished career in the US Army that included senior leadership positions that oversaw large-scale military operations, logistics, technology integration and multi-national partnerships. More recently, Smith served as the Deputy Commanding General of Western Hemisphere Command, where he oversaw about 700,000 personnel with a $4.8bn budget.

At Ascent, his role will involve leveraging his experience with military operations, technology adoption and government partnerships to advise company leadership on strategic opportunities and potential applications for its thin-film PV technology within its core markets.

"Tom Bawol and Lieutenant General Steve Smith are both proven leaders that bring exceptional experience in relationship development and identifying actionable business development opportunities where our thin-film solar technology can actively address real-world challenges," says CEO Paul Warley. "Their expertise will play a crucial role in our continued efforts to expand the commercial reach of our thin-film products in space, defense, unmanned systems, marine and other core markets."

www.AscentSolar.com

Midsummer to form JV with Indonesia's Metalogika

Metalogika to establish solar cell manufacturing in Indonesia with Midsummer equipment and know-how

Midsummer AB of Järfälla, near Stockholm, Sweden and Indonesian technology industrial company PT Metalogika Rekayasa Sistem have signed a binding investment and industrialization framework agreement for the establishment of a manufacturing platform in Indonesia for Midsummer's lightweight, flexible copper indium gallium diselenide (CIGS) thin-film solar cell and photovoltaic module technology.

PT Metalogika intends to establish a thin-film flexible solar panel production facility in Indonesia with an initial production capacity of 20MW per year, with potential further expansion toward 200MW annually, for the sale of solar panels in the Indonesian market and abroad.

Midsummer will supply the manufacturing equipment and related services for the establishment and operations of the solar cell factory to the new joint venture, and also assume a minority ownership in the Indonesian joint venture.

Initial investment package for 20MW/year facility

The range of equipment that is currently contemplated consists of Midsummer's proprietary DUO system for the production of thin-film solar cells, other manufacturing equipment and services sufficient for a 20MW per year solar cell factory.

Equipment procurement will be entered into by the Indonesian joint venture following its incorporation and satisfaction of the agreed conditions. This structure is intended, among other things, to allow the project to establish the appropriate Indonesian investment and import framework before manufacturing equipment is imported.

Scalable roadmap toward 200MW and beyond

The initial 20MW facility is intended as the first phase of a broader industrial roadmap. Following commissioning and operation, the parties intend to evaluate expansion



toward 200MW of annual production capacity, with longer-term potential for further expansion toward gigawatt scale, subject to market demand, financing, operational performance and future investment decisions.

The strategic ambition is to develop Indonesia into an important manufacturing node within Midsummer's geographically distributed production ecosystem, initially serving Indonesia and progressively supporting opportunities in Southeast Asia and other markets.

Validation of technology and strategic offering

"Our ambition is to build a long-term industrial partnership in Indonesia, combining Midsummer's technology and manufacturing experience with Metalogika's Indonesian industrial capabilities," says Midsummer's CEO Eric Jaremalm. "We intend to start with a clearly defined 20MW industrial project, while creating the foundation from which the partnership can scale significantly as the market develops," he adds. "I see this as another validation of Midsummer's technology and of our strategy to offer partners not only equipment and solar products but access to a complete industrial manufacturing platform — technology, know-how, engineering, training, procurement and long-term production support."

Pathway toward significantly greater Indonesian manufacturing capacity

"Our objective is to establish advanced solar manufacturing capability in Indonesia and progressively build a locally anchored industrial ecosystem around it," says PT Metalogika Rekayasa Sistem's president director Firrisky Nurtomo. "One of the nearest aims is to support the country's focus to strengthen energy independence and security. Midsummer brings not only manufacturing technology but experience, know-how and access to a wider international production ecosystem," he adds.

"The initial facility gives us a practical starting point while the longer-term roadmap provides a pathway toward significantly greater Indonesian manufacturing capacity with local components to serve the region potential market. In line with the recently launched US$73bn program by President Prabowo Subianto to build 100GWp of solar power capacity across the country and the electrification of 80,000 rural areas."

Massive solar energy potential

The parties will now proceed with incorporation of the joint venture, finalization of the investment and governance structure, applicable Indonesian approvals and incentives, project financing and definitive equipment and technology agreements.

Indonesia has a population of about 285 million. It is the largest economy in Southeast Asia with a gross domestic product exceeding US$1.4 trillion and growing at 4–5% per year. Indonesia's energy mix is heavily reliant on fossil fuels, with renewable energy sources making up about 18% of the power generation mix. Located directly on the equator, Indonesia has massive solar energy potential, backed by a very high daily solar radiation average and government ambitions for a rapid scale-up of solar energy production.

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More thermally stable InP quantum dot near-infrared laser diodes

Researchers achieve a high T_0 characteristic temperature of 125K at 780nm.

Hong Kong University of Science and Technology (HKUST) in China reports multi-stack indium phosphide (InP) quantum dot (QD) 780nm lasers on silicon (Si) with a high characteristic temperature (T0) of 125K in the near infrared (NIR) [Wen Gu et al, Optics Letters, v51, p3641, 2026].

The devices benefited from optimizing the number of layers to 5, and by using silicon substrates rather than gallium arsenide (GaAs). In particular, the threshold current density was reduced through the improved modal gain from 5 layers of InP QDs, and the higher thermal conductivity of silicon resulted in better thermal management.

The team comments: "These results indicate that optimized active-region stacking is an effective approach to mitigate the thermal bottleneck of InP QD NIR lasers on silicon platforms."

The researchers see monolithic integration of NIR InP QD lasers on silicon as being essential for on-chip quantum technologies and biophotonics, along with spectroscopy. However, up to now these devices have not been able to match the performance of the more mature communications wavelengths of 1.3μm and 1.5μm.

The team comments: "Achieving reliable NIR emission on silicon remains a challenge, as direct epitaxial growth of III–V materials on silicon is fundamentally hindered by lattice and thermal expansion mismatches. These mismatches induce high densities of threading dislocations, which act as non-radiative recombination centers that cause severe thermal quenching at elevated temperatures".

QD devices tend to be more tolerant of defects. For example, QDs have enabled 1.3μm lasers on silicon with T0 values of more than 200K.

The material structures (Figure 1) were grown on GaAs substrates or GaAs on planar silicon (GoPS) templates by metal-organic chemical vapor deposition (MOCVD). The GoPS material was grown by MOCVD using a thermal cycle annealing and dislocation filter layers method developed at HKUST to reduce the

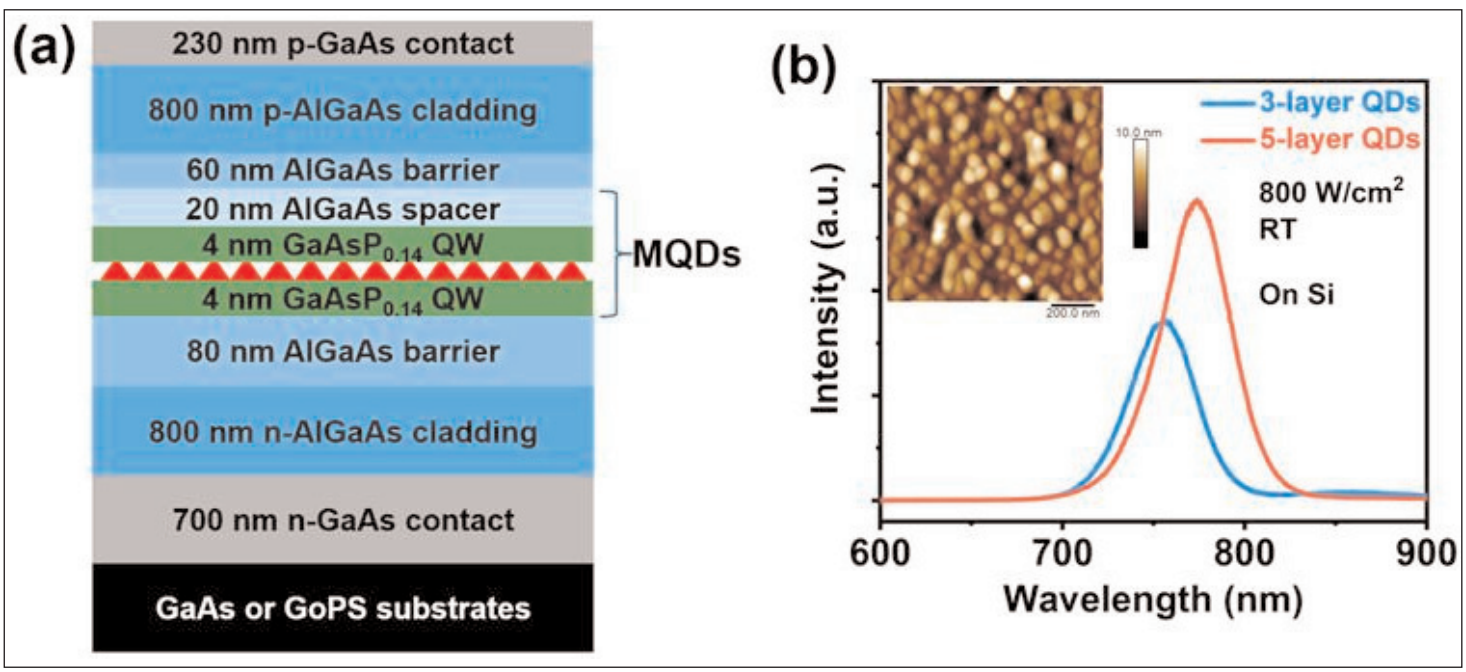


Figure 1. (a) Schematic of InP/GaAsP QD laser grown on GaAs or silicon substrates. (b) Room-temperature (RT) micro-photoluminescence spectra of the 3-layer and 5-layer QD structures on silicon. Inset: 1μm x 1μm atomic force microscope (AFM) image of uncapped 5-layer QDs on silicon sample.

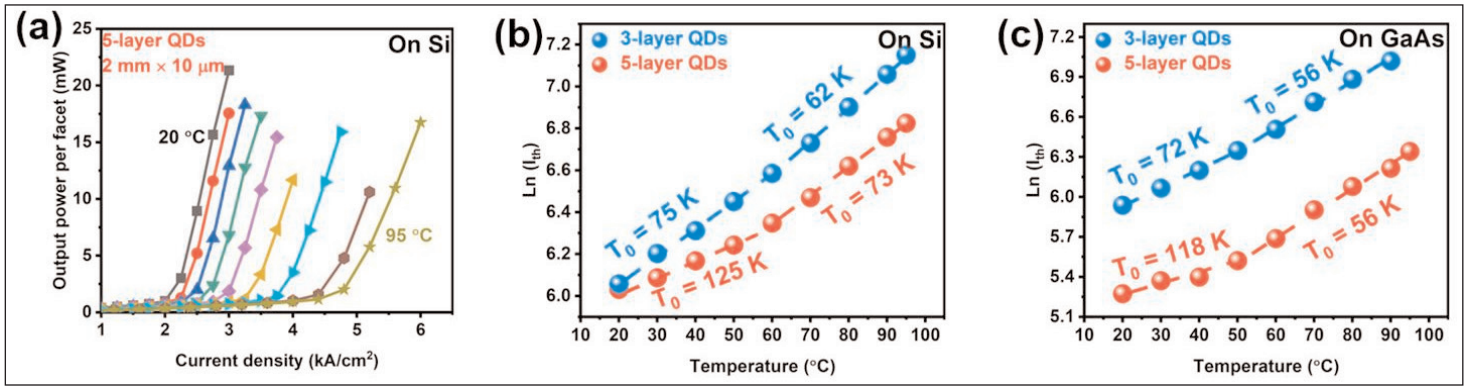


Figure 2. (a) Temperature-dependent light output power–current density characteristics from 20°C to 95°C for 5-layer QD laser on silicon (2mm x 10μm). Comparison of extracted T_0 of 3-layer and 5-layer QD lasers on (b) silicon and (c) GaAs substrates.

defect density in the GaAs by a factor of 40. Relatively thick aluminium gallium arsenide (AlGaAs) cladding layers were used to ensure sufficient optical mode confinement.

The InP QD active regions were grown in GaAsP quantum wells (QWs), repeated 3 or 5 times, separated by AlGaAs spacers. The dots were grown at 680°C, while the rest of the structure was grown at 650°C. The 5-layer QD structure on silicon had a QD density of $1.8x10^{10}/cm^2$.

The GaAsP QWs had a low phosphorus content, relative to previous HKUST QD structures. This reduced accumulated strain, allowing better quality multi-stacks of QDs.

The material was fabricated into ridge-waveguide laser diodes. The silicon substrate was thinned to enable cleaving into laser bars, and to reduce thermal resistance for better heat dissipation.

The devices were placed on a temperature-controlled copper stage, and operated in pulsed mode to avoid self-heating effects. The turn-on voltage was around 1.5V for all devices. The thicker 5-layer device on silicon had a slightly higher 13Ω on-resistance, compared with 9Ω for the 3-layer laser diode.

For ridges measuring 1.2mm x 70μm, the laser threshold current density (J_{th}) was $0.94kA/cm^2$ for the 3-layer laser diode, and $0.86kA/cm^2$ for 5 layers.

The researchers comment: "The reduced J_{th} for 5-layer devices is due to the increase in their mode gain. In addition, 5-layer devices allow the threshold condition to be met at a lower carrier occupancy per dot. Consequently, this minimizes heat generation and suppresses carrier thermal escape into the barrier layers, enhancing thermal stability."

The team also notes that there is a limit to adding layers, since the increased strain would eventually lead to material quality degradation.

Studying the temperature dependence of the laser performance on temperature allowed extraction of the characteristic temperature (T_0) for the threshold current increase (Figure 2).

The researchers report: "For the 5-layer QD laser on silicon, a high T_0 of 125K was achieved in the 20–50°C range, representing a significant improvement over the 75K measured for the 3-layer counterpart on silicon. Above 50°C, both devices exhibit a typical reduction in T_0 due to increased thermal carrier escape; however, the 5-layer QD laser on silicon maintains a higher T_0 of

Table 1. Comparison of T_0 for MOCVD-grown InP QD lasers.

	Wavelength (nm)	Stacking Number	T_0 (K)	Substrate
Previous work:				
	757	5	74K (20–95°C)	Si
	755	1	55K (20–60°C), 30K (60–95°C)	GaAs
	638	1	124K (5–20°C), 49K (20–40°C)	GaAs
	660	1	85K (5–25°C), 53K (5–55°C)	GaAs
	741	5	52K (10–85°C)	GaAs
	774	5	111K (7–47°C), 89K (47–87°C)	GaAs
Latest HKUST work:				
	752	3	72K (20–50°C), 56K (50–90°C)	GaAs
	771	5	118K (20–50°C), 56K (50–90°C)	GaAs
	765	3	75K (20–50°C), 62K (50–95°C)	Si
	780	5	125K (20–50°C), 73K (50–95°C)	Si

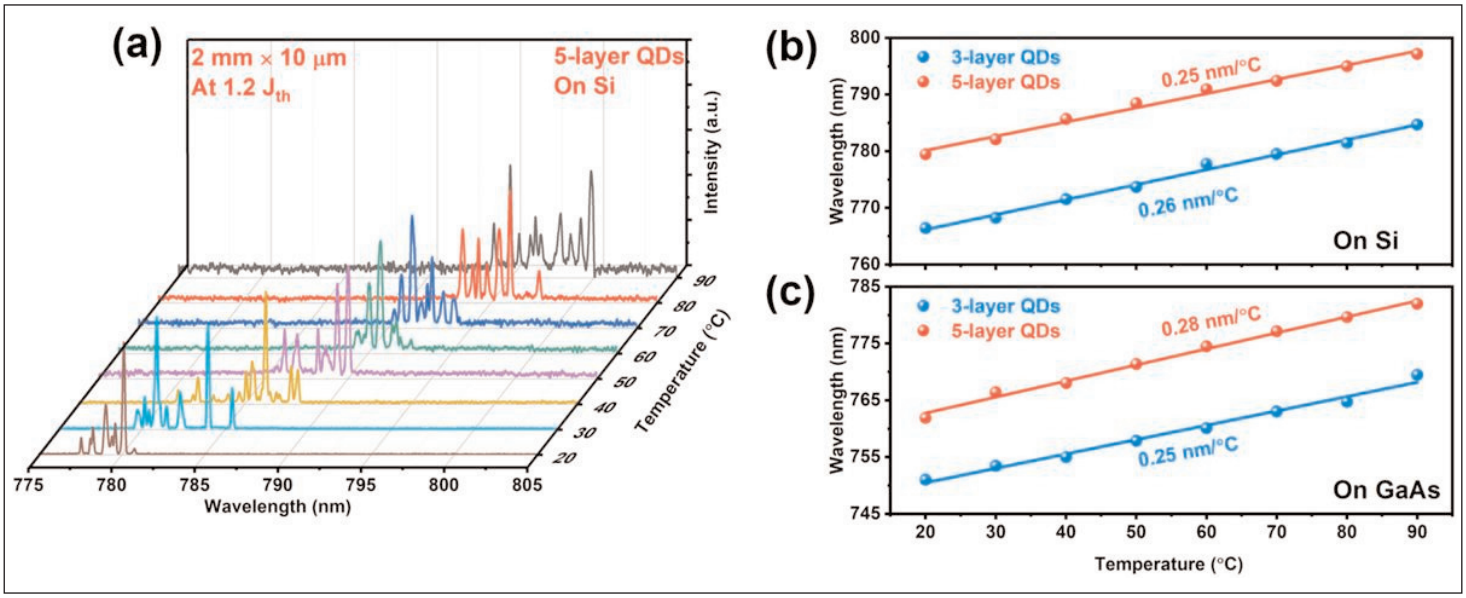


Figure 3. (a) Temperature-dependent lasing spectra of the 5-layer quantum dot 2mm x 10μm lasers at 1.2x threshold current. Temperature-dependent lasing peaks of 3-layer and 5-layer quantum dot lasers on (b) silicon and (c) GaAs substrates.

73K, outperforming the 62K of the 3-layer QD laser on silicon."

The better T_0 performance for the 5-layer device is attributed to increased modal gain from the extra layers. The devices on GaAs have somewhat lower T_0 values due to the lower thermal conductivity of GaAs, relative to silicon.

The researchers compared their latest work with previous studies of similar devices emitting in the wavelength range 630–800nm (Table c). The team sees their devices as being "highly competitive".

"These findings confirm that increasing the stacking layers of the active region significantly enhances thermal stability and provides a robust solution for high-T_0 light sources directly onto silicon platforms," they write.

The researchers also studied the spectral tuning capability with temperature (Figure 3). The team comments: "The similar thermal tuning behavior between the 5-layer QD laser on silicon and GaAs exhibits the high material quality of our monolithically integrated silicon-based light sources." ■

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Author: Mike Cooke

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First continuous-wave UV VCSEL operation at room temperature

A new device design benefits from reduced optical losses and improved thermal dissipation.

Researchers based in China claim the first gallium nitride (GaN)-based electrically injected continuous-lasing ultraviolet (UV) vertical-cavity surface-emitting laser (VCSEL), achieved by "careful design and processing" [Zhi-Jie Zou, et al, Appl. Phys. Lett., v128, p253501, 2026].

"Until now, GaN-based UV VCSELs have been demonstrated under optical pumping, but there are still no electrically injected VCSELs with lasing wavelength shorter than 402nm," reports the team from Xiamen University, Institute of Semiconductors, and Southern University of Science and Technology (SUSTech).

The research focused on reducing optical losses, and improving the thermal performance of the device. The researchers report: "These efforts allowed us to realize the UV VCSEL lasing at room temperature at a wavelength of 380.1nm and a threshold of 14.9kA/cm^2."

The team hopes that their work will contribute to more successful UV GaN laser deployment for biological regulation, sterilization, disinfection, medical treatment, and UV curing.

The UV VCSEL (Figure 1) included double dielectric distributed Bragg reflectors (DBRs). The III–nitride epitaxial material was grown on c-plane sapphire through metal-organic chemical vapor deposition.

The cladding was aluminium gallium nitride (AlGaN) layers, containing 5% aluminium on the n-side and 4.5% on the p-side. These cladding layers were both 600nm thick. The doped GaN waveguide (WG) layers were both 150nm. The active light-generating region consisted of a multiple quantum well (MQW) stack consisting of indium gallium nitride ($In_{0.05}Ga_{0.95}N$) wells and GaN barriers.

The epitaxial material was prepared for the laser fabrication by laser lift-off removal of the sapphire substrate and chemical mechanical polishing to smooth the exposed n-GaN surface from 1.71nm to 0.24nm roughness. This was expected to reduce interface scattering loss from 3.26% to 0.07%, thus decreasing the gain threshold for lasing.

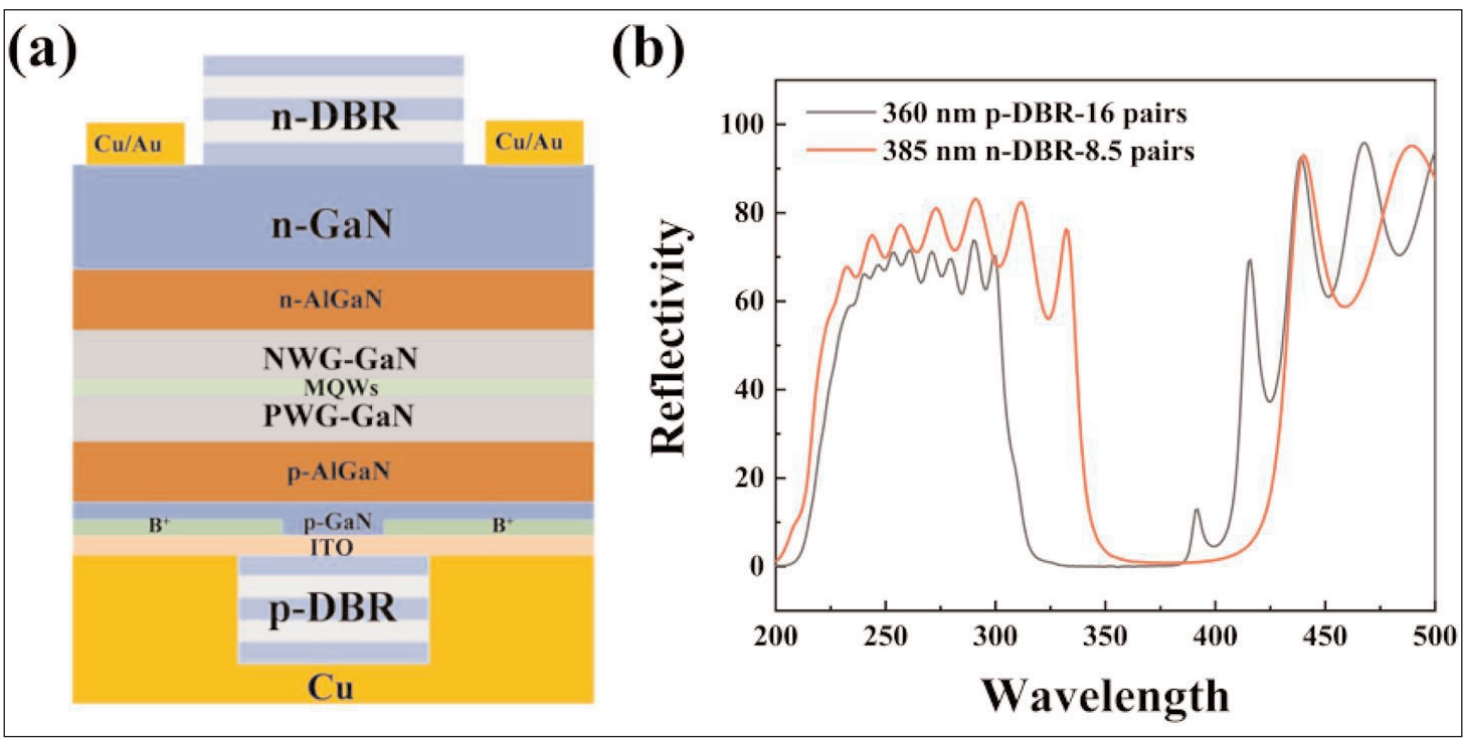


Figure 1. (a) UV VCSEL structure and (b) reflectivity spectra of DBRs.

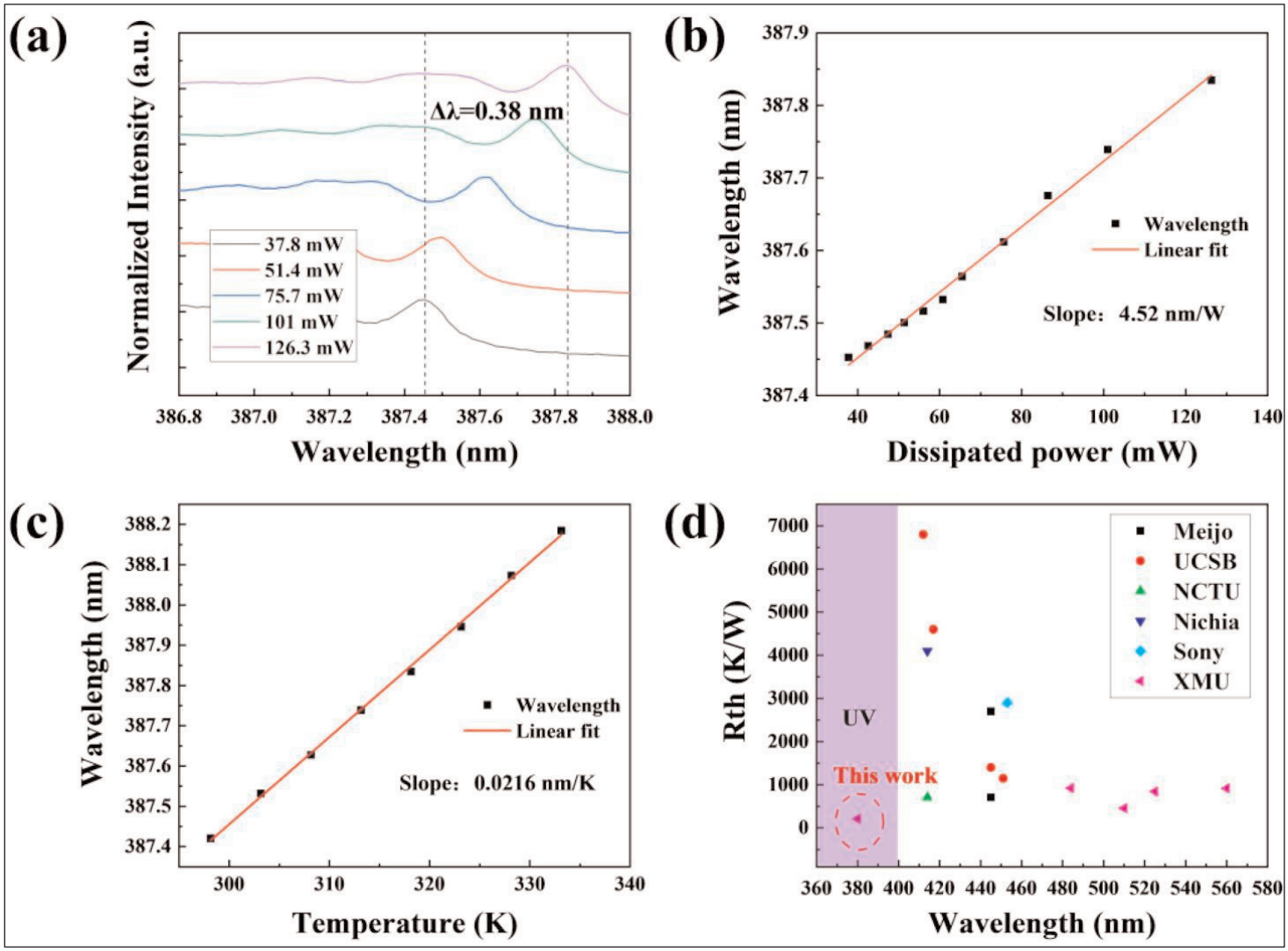


Figure 2. (a) Normalized electroluminescence (EL) spectra at different bias powers. Variations of wavelength with (b) dissipated power and (c) device temperature; (d) thermal resistance versus wavelength comparisons of GaN-based resonant-cavity light-emitting devices in research literature.

The laser cavity was defined by two dielectric hafnium oxide and silicon dioxide (HfO_2/SiO_2) DBR reflecting structures. The p-side contained 16 layer pairs, and the n-side contained 8.5. The center wavelengths for transmission were 360nm and 385nm for the p-side and n-side, respectively. The cavity length was about 4μm.

The researchers report: "The difference in the center wavelength is due to the unstable growth parameters. At 380nm, the transitivity is 0.195% for the p-DBR and 0.777% for the n-DBR. The overlap region of the low-transitivity bands covers the wavelength range of the epitaxial quantum well peak (365–385nm). Consequently, the deviation in the DBR center wavelengths does not significantly affect the quality of resonant cavity."

The 8μm-diameter current-injection aperture was confined by ion implants of boron (B). The DBR structures were etched using inductively coupled plasma. Indium tin oxide (ITO) was used as a (relatively) transparent current-spreading layer. The copper heatsink structure was applied by electroplating. The n- and p-electrodes were both chromium/gold (Cr/Au).

The designed emission wavelength was in a region where the light absorption of ITO rapidly increases, and thus it was desired to make this layer as thin as possible; this layer was 20nm in the reported device, compared with the ~50nm typically used in blue VCSELs.

Also, HfO_2 was used as an optical adjustment layer with the aim of putting the ITO at a node and the MQW at an anti-node of the optical field: i.e. the ITO was placed at a position of minimum electromagnetic oscillation and the MQW at a maximum.

The lasing wavelength of the device red-shifted by 0.38nm as the bias power increased from 37.8mW to 126.3mW (Figure 2). The slope of a linear fit was 4.52nm/W. Increasing the ambient temperature of the device also red-shifted the wavelength at a rate of 0.0216nm/K. The thermal resistance was estimated at 209K/W (4.52/0.0216).

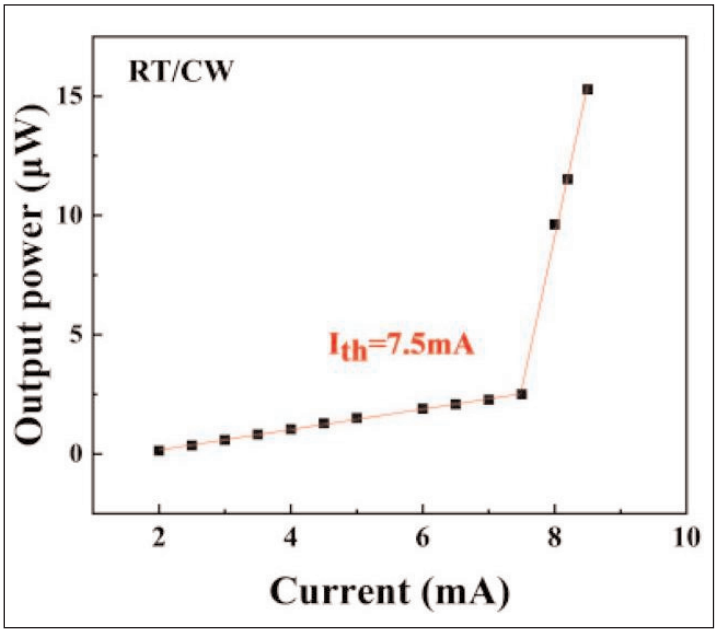


Figure 3. Output power versus injection current.

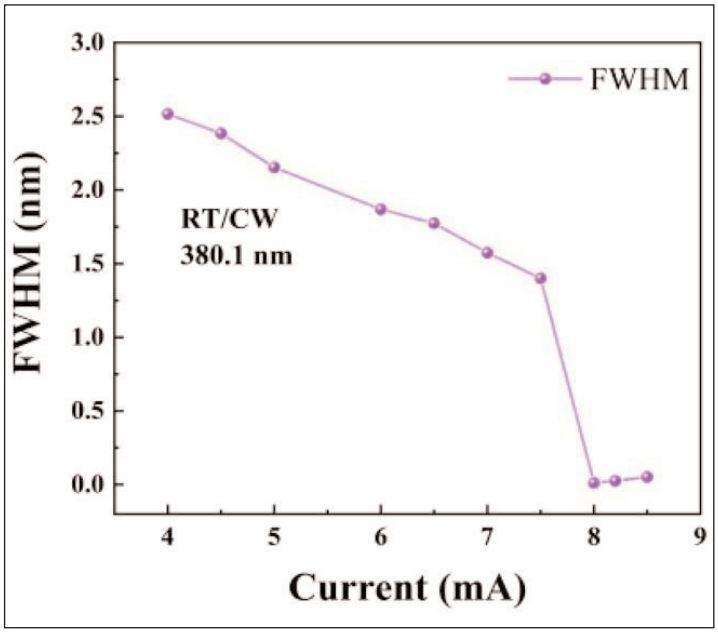


Figure 4. Evolution of full-width at half-maximum (FWHM) of 380.1nm peak with injection current.

The researchers comment: "The lower thermal resistance indicates better heat dissipation capability, which is attributed to the use of the B+-implanted layer and the electroplated copper plate."

The continuous wave (CW) threshold current (I_{th}) at room temperature (RT) was 7.5mA (14.9 kA/cm^2), evidenced by an increase in slope of the output power curve (Figure 3).

The main peak at 380nm also significantly narrowed in the region of the threshold (Figure 4). At 8.2mA injection the FWHM was 28pm. A second cavity mode was observed at 375nm wavelength. The electrical diode characteristics include a 4.3V turn-on, and ~10^{-8}A reverse current leakage. ■

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Author: Mike Cooke

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Reducing micro-LED sidewall impact

Neutral reactive N/H treatment increases EQE in 5μm GaN device by 34%.

Researchers based in China have reported 34% enhanced external quantum efficiency (EQE) of a 5μm gallium nitride (GaN) blue light-emitting diode (LED) from a neutral reactive nitrogen/hydrogen (N/H) treatment [Kai Li et al, Appl. Phys. Lett., v129, p032103, 2026].

The team from University of Science and Technology of China, Suzhou Institute of Nano-tech and Nano-bionics, and Jiangsu Institute of Advanced Semiconductors, reports: "Treatment of neutral reactive N/H species effectively mitigates the surface Fermi-level pinning and reduces the defect-related surface states. This step is directly followed by vacuum-interconnected atomic layer deposition (ALD) passivation, preventing air exposure and secondary impurity adsorption."

The use of neutral N/H radicals also has the advantage of avoiding surface charging, generating strong local electric fields, and consequent anomalous band bending at the sidewalls.

Micro-LEDs are particularly sought for next-generation high-resolution displays and for communication technologies due to high brightness, high efficiency,

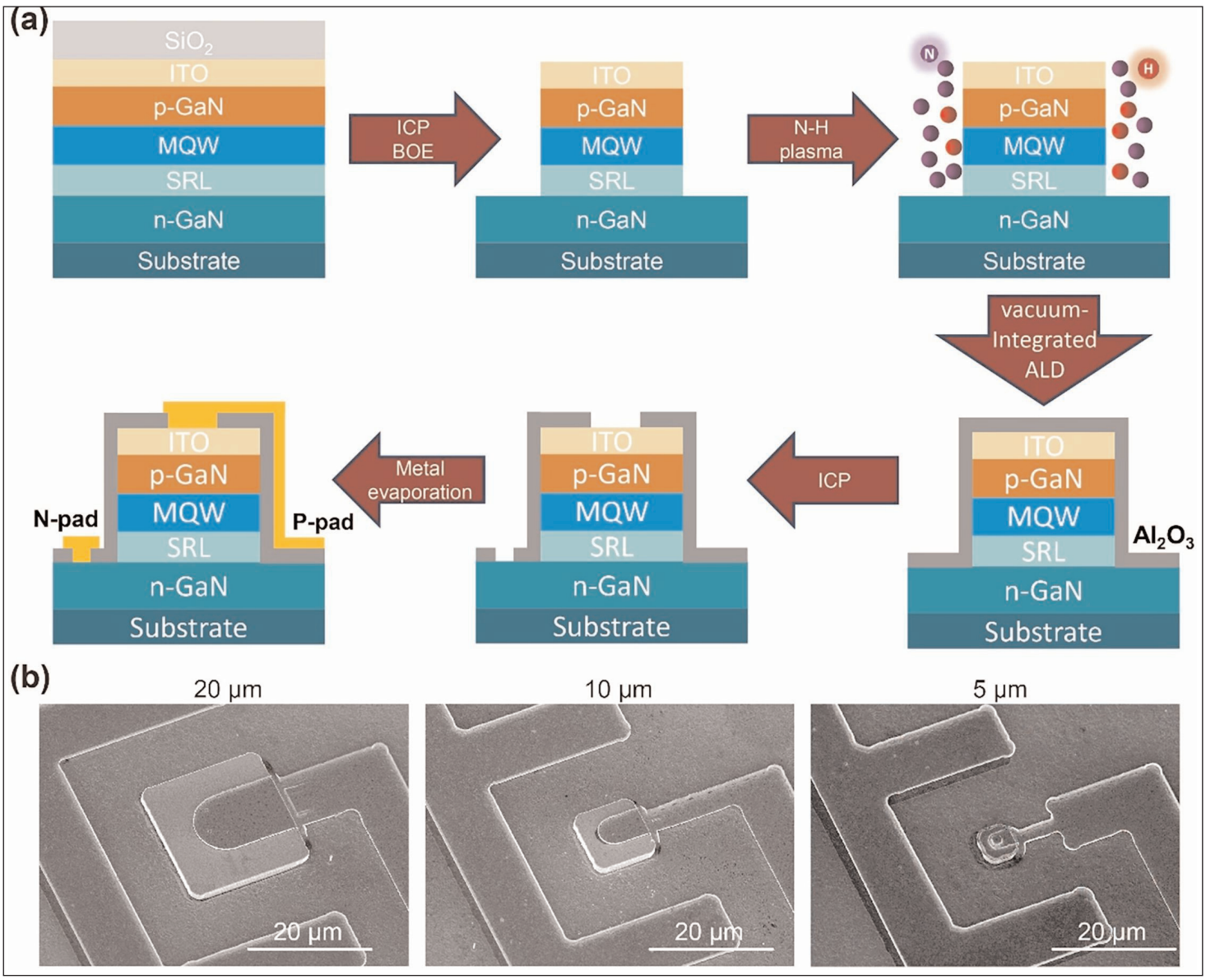


Figure 1. (a) Fabrication process for micro-LED chip arrays. (b) SEM images of micro-LED chips with various sizes.

fast response, and long operational lifetime. However, micro-LEDs suffer from increased sidewall negative impacts due to the perimeter/area ratio scaling inversely with size.

Conventional methods to reduce sidewall defects and efficiency losses often involve etching the surface back. This can smooth the surface, making it more liable to reflect light back into the device, reducing the light extraction efficiency.

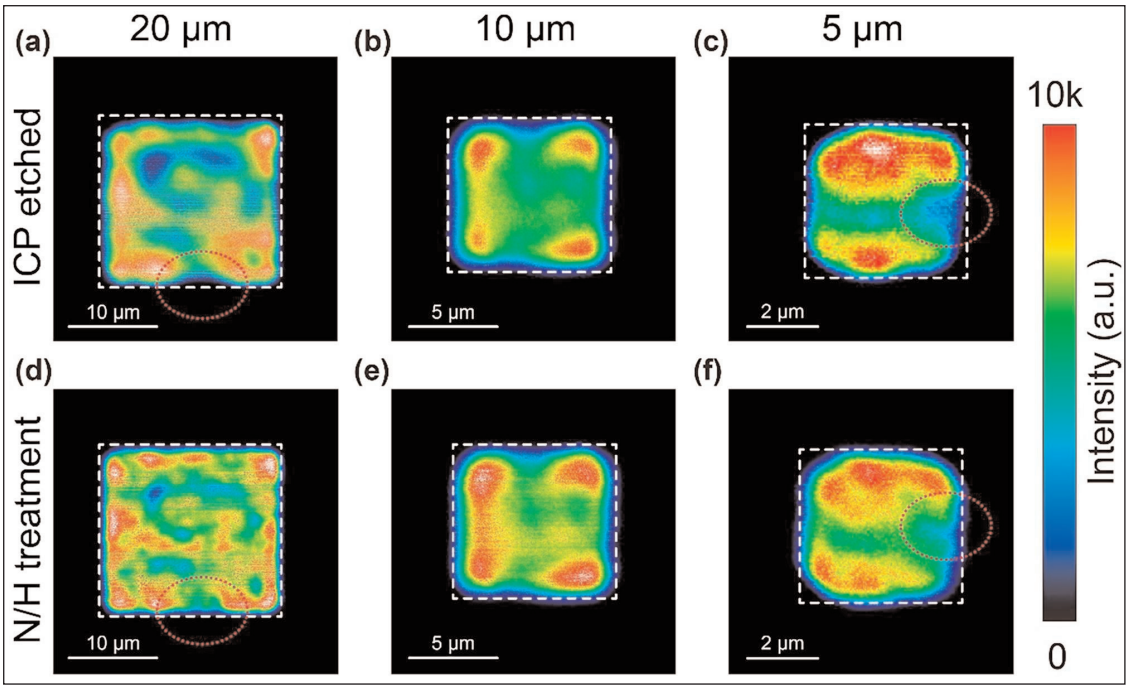


Figure 2. Laser scanning confocal microscopy (LSCM) images of micro-LEDs before (a–c) and after (d–f) neutral N/H radical treatment. Mesa sizes: 20μm (a, d) 10μm (b, e), and 5μm (c, f).

Device fabrication (Figure 1) began with commercial blue LED epitaxial material consisting of silicon-doped n-GaN, 20 cycle strain-release layer (SRL), six pairs of multiple quantum well (MQW), and magnesium-doped p-GaN. Indium tin oxide (ITO) was added by magnetron sputtering to encourage current-spreading.

The device mesa was etched by inductively coupled plasma (ICP) with a silicon dioxide (SiO_2) layer used as a mask. The mask was removed by buffered oxide etching (BOE).

The sidewall was repaired by exposure to radio frequency (RF) sourced nitrogen/hydrogen (N/H) radicals. The material was then transferred to an ALD chamber in vacuum to avoid oxidation and other secondary contamination of the sidewall. The ALD process was used to apply 30nm aluminium oxide (Al_2O_3) as sidewall passivation.

The titanium/aluminium/nickel/gold metal electrodes were deposited through ICP-etched contact vias.

The impact of the sidewall treatment was most significant on the smallest 5μm LED: the peak external quantum efficiency (EQE) increased to 18.52% from 13.76%, an increase of 34.6%. The larger devices benefited to a lesser extent: from 26.92% to 29.71%, and from 24.63% to 28.13%, for the 20μm and 10μm LEDs, respectively.

The reverse current leakage at −5V was also significantly reduced by up to five orders of magnitude: from $7.53x10^{-3}A/cm^2$ to $6.37x10^{-7}A/cm^2$, from $8.44x10^{-2}A/cm^2$ to $2.26x10^{-6}A/cm^2$ and from $1.30A/cm^2$ to $9.64x10^{-6}A/cm^2$ for the 20μm, 10μm and 5μm devices, respectively. Also, the treatment eliminated a low-forward-bias hump in the current–voltage characteristics. This enhanced current–voltage performance is credited to suppression of etching-induced leakage by the N/H radical treatment.

The researchers add: "These improvements are attributed to the reduced sidewall carrier loss, non-radiative recombination, and shunt leakage paths, which are especially critical in smaller micro-LEDs because of their larger surface-to-volume ratio."

Secondary-ion mass spectrometry (SIMS) analysis showed reduced levels of fluorine (F), chlorine (Cl), and carbon (C) after the N/H treatment. The researchers comment: "The decrease in carbon concentration is due to the removal of adventitious hydrocarbons/organic residues introduced during air exposure. chlorine residues associated with Cl-based plasma etching and fluorine residues introduced during HF stripping of the SiO_2 hard mask can be effectively removed during N/H treatment."

In particular, the hydrogen reacts with the halogens F/Cl, while the nitrogen combines with under-coordinated surface gallium sites generated after the halogen extraction from the surface.

The team explains: "This synergistic process suppresses N-vacancy- and Ga-rich-related defects and contributes to the recovery of the surface stoichiometry and electronic structure of GaN."

The N/H treatment was found to be effective in increasing emission, particularly in 'dead zone' regions (Figure 2, dotted circles). ■

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Author: Mike Cooke

Weak polarization electric-field c-plane GaN LEDs

Researchers achieve 15% external quantum efficiency in a manufacturable structure.

Researchers based in China and Saudi Arabia claim the highest external quantum efficiency (EQE) so far for light-emitting diodes (LEDs) using weak polarization electric field (PEF) multiple quantum well (MQW) structures with effective indium aluminium gallium nitride (InAlGaN) quantum barriers (QBs), achieved through c-plane digital alloy (DA) growth on patterned sapphire substrate [Jingkai Zhao et al, Light: Science & Applications, v15, p300, 2026]. The researchers estimate the PEF in their devices to be as low as 0.5MV/cm, compared with more than 1MV/cm for conventional c-plane GaN MQW structures.

Quaternary InAlGaN material allows tuning of lattice parameters, reducing strain and thus piezoelectric and spontaneous fields. Such fields are known to adversely affect electron-hole recombination into photons, reducing light output power (LOP) and EQE. In particular, the electric field is usually in such a direction as to shift the electrons and holes away from each other in LED structures. This is the quantum-confined Stark effect (QCSE).

Unfortunately direct growth of InAlGaN is tricky and tends to result in low crystal quality and rough surfaces. This is partly attributable to an inability to effectively mix InN and AlN bonds in the same structure due to the different bond lengths. Digital alloying avoids this problem by alternately depositing thin layers of AlGaN and InGaN to give a short-period superlattice with an effective InAlGaN QB structure.

The team from Jilin University and King Abdullah University of Science and Technology (KAUST) optimized the DA process to enable a 15% peak EQE

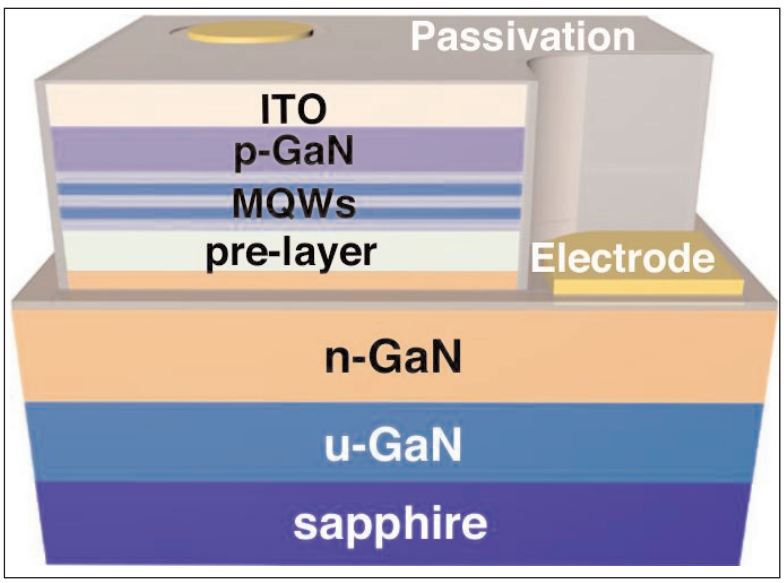


Figure 1. DA-based LED device structure.

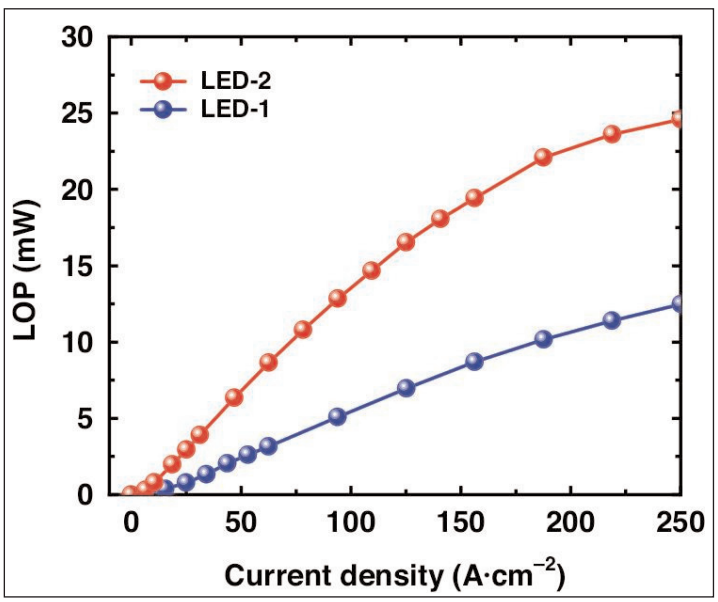


Figure 2. Light output power (LOP) versus injected current density of 147μm x 264μm LEDs.

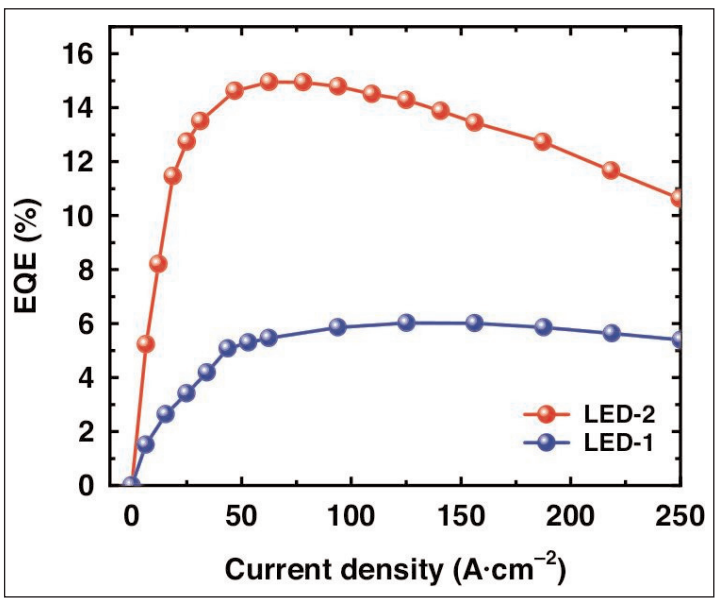


Figure 3. External quantum efficiency (EQE) versus injected current density.

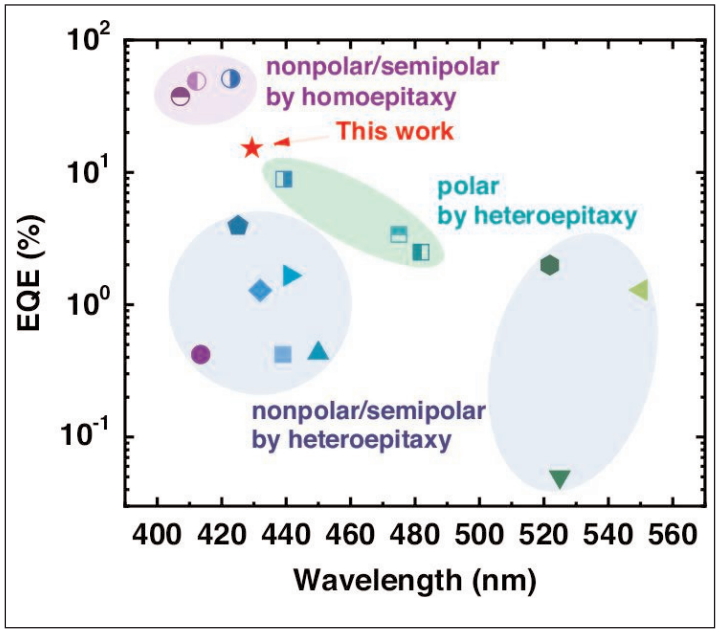


Figure 4. Comparison of the peak EQE of LED-2 and weak-PEF LEDs from other reports.

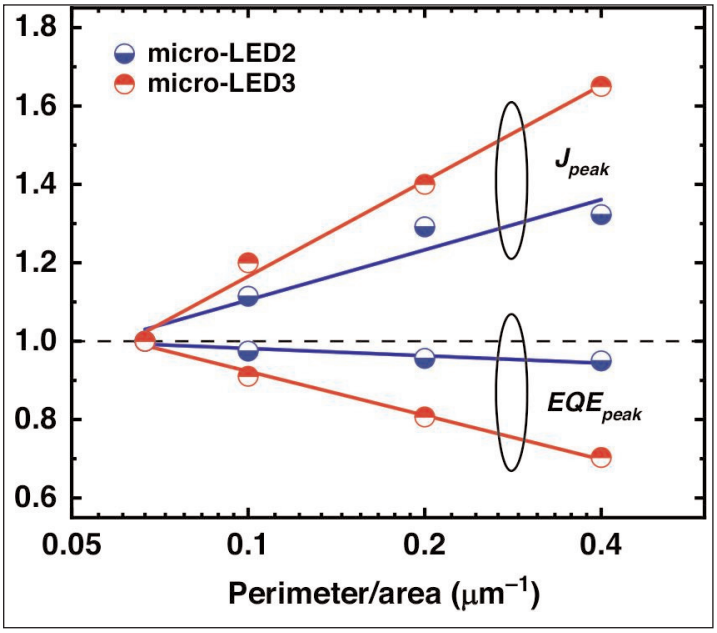


Figure 5. Normalized peak EQE and corresponding current density (J) versus ratio of perimeter to area for square micro-LED-2 and conventional InGaN/GaN MQW micro-LED-3. Values normalized to the results of the largest-size 60μm LED.

in their best LED.

The researchers fabricated LEDs with digital-alloy QBs between the MQWs (Figure 1). The devices were produced on 4-inch wafers prepared on sapphire by metal-organic chemical vapor deposition (MOCVD). Trimethyl metal-organic molecules were used for the indium and aluminium precursors. Triethyl-Ga was used for the gallium source, and ammonia (NH_3) for nitrogen.

In preliminary studies, the researchers found that reducing the ammonia flow during the InAlGaN quantum barrier (QB) digital alloy deposition improved the material quality for LED light output (Figure 2). The researchers believe that the optimized ammonia delivery scheme effectively suppressed incorporation of additional indium atoms and prevented generation of nitrogen vacancies.

The LED-1 was produced with constant ammonia flow of 20 standard liters per minute (slm) during both the AlGaN and InGaN layer periods of the DA. For LED-2, the ammonia was reduced to 5slm during the Al and Ga pulses used to deposit the AlGaN periods. The QWs consisted of two 2.5nm $In_{0.15}Ga_{0.85}N$ layers grown at 750°C. The QB growth was at 720°C. The DA QB consisted of 6 pairs of 1nm/1nm InGaN/AlGaN layers, giving 12nm in total.

The 25.0mW LOP of LED-2 was increased by 97% over that of LED-1 at 250A/cm^2 current injection.

The peak EQE of LED-2 reached 15% and remained above 10% up to 250A/cm^2 injection (Figure 3). The blue-shift of the peak wavelengths were 0.4nm and 0.3nm for LEDs 1 and 2, respectively. A third LED fabricated with conventional InGaN/GaN MQW material suffered a 5.9nm wavelength shift, demonstrating one effect of not using DAs in conventional PEF structures.

The researchers compared their weak PEF LED-2 performance with other reports (Figure 4). The team comments: "It can be observed that LED-2 exhibits the highest EQE (15%) among previously reported heteroepitaxial weak-PEF LEDs grown on polar plane (maximum 8.8%) and nonpolar/semipolar plane (maximum 3.9%). It is only lower than weak-PEF LEDs grown on nonpolar/semipolar planes by homoepitaxy. In this context, although homoepitaxial nonpolar/semipolar weak-PEF LEDs can achieve higher EQE, their reliance on expensive substrates and limited process compatibility makes them less favorable for manufacturing. Taken together, our approach provides a manufacturable weak-PEF route that retains polar c-plane compatibility within heteroepitaxial platforms."

The researchers also showed that the peak EQE and its corresponding current density shifted less for the digital alloy MQW micro LEDs, compared with LEDs fabricated from conventional InGaN/GaN MQW material (Figure 5). The efficiency of smaller devices tends to degrade due to non-radiative recombination at the sidewalls. Based on these results, the researchers suggest that the weak-PEF LED exhibits an approximate 50% reduction in sidewall sensitivity compared with the conventional LED.

The team comments: "Such a characteristic is crucial for micro-LEDs, where strong carrier confinement contributes to mitigate efficiency losses induced by sidewall effects." ■

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Author: Mike Cooke

RF GaN patenting activity slowing as technology matures

...but intensifying in selected segments and regions, says KnowMade.

RF gallium nitride GaN technology is entering a new phase of growth and strategic competition, notes KnowMade in its report RF GaN Technology Patent Landscape Analysis 2026.

While telecoms infrastructure remains an important market, demand is increasingly supported by defense, electronic warfare, counter-drone systems and satellite communications. At the same time, the industrial landscape is being reshaped by consolidation, technology licensing, patent transfers, manufacturing-sovereignty initiatives and restrictions affecting access to critical materials and process know-how.

Maturing RF GaN patent landscape with focused areas of competition

KnowMade's analysis reveals a dual trend. Overall RF GaN patenting activity is slowing as the technology matures, yet competition is intensifying in selected technology segments and geographic regions. Portfolio breadth, international patent coverage and control of critical process technologies are becoming increasingly important dimensions of IP leadership.

GaN-on-SiC (silicon carbide) remains the reference platform for high-power telecoms, radar and electronic warfare applications. Its strong power density, thermal performance, reliability and qualification history continue to support its position. However, substrate availability, manufacturing know-how, long qualification cycles and the transition toward larger wafer diameters maintain high barriers to entry.

In parallel, GaN-on-Si is progressing from an emerging platform toward early industrialization, supported by 8-inch manufacturing. Its development could create opportunities in lower-power radio architectures and, over the longer term, in FR3 and 6G applications above 10GHz. Nevertheless, cost competitiveness, thermal management, reliability, process maturity and scalability remain important technical challenges.

Innovation is also extending toward longer-term platforms such as GaN-on-diamond and GaN-on-AlN

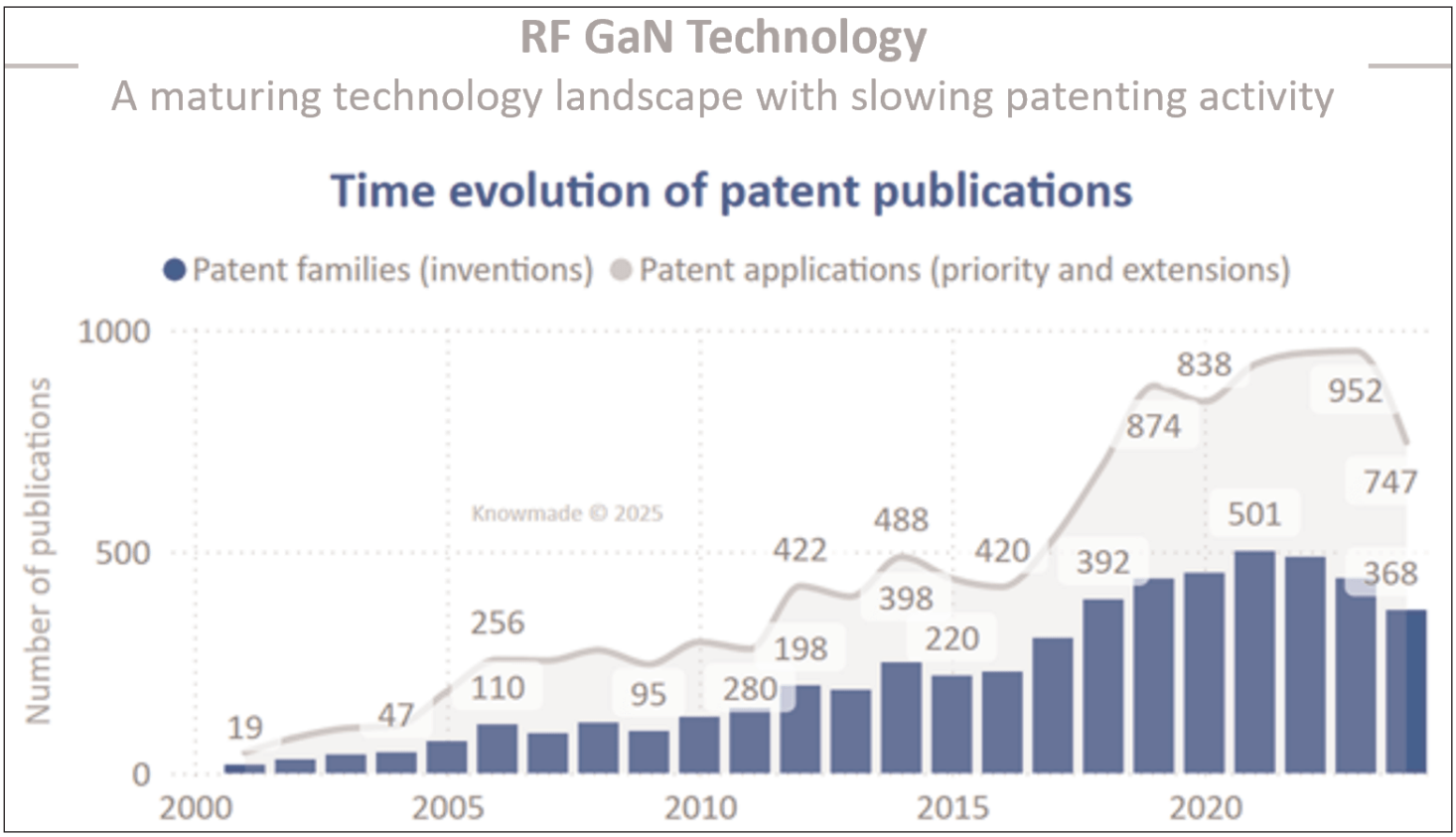


Figure 1: Time evolution of RF GaN patent publications, highlighting the progressive maturation of the global patent landscape.

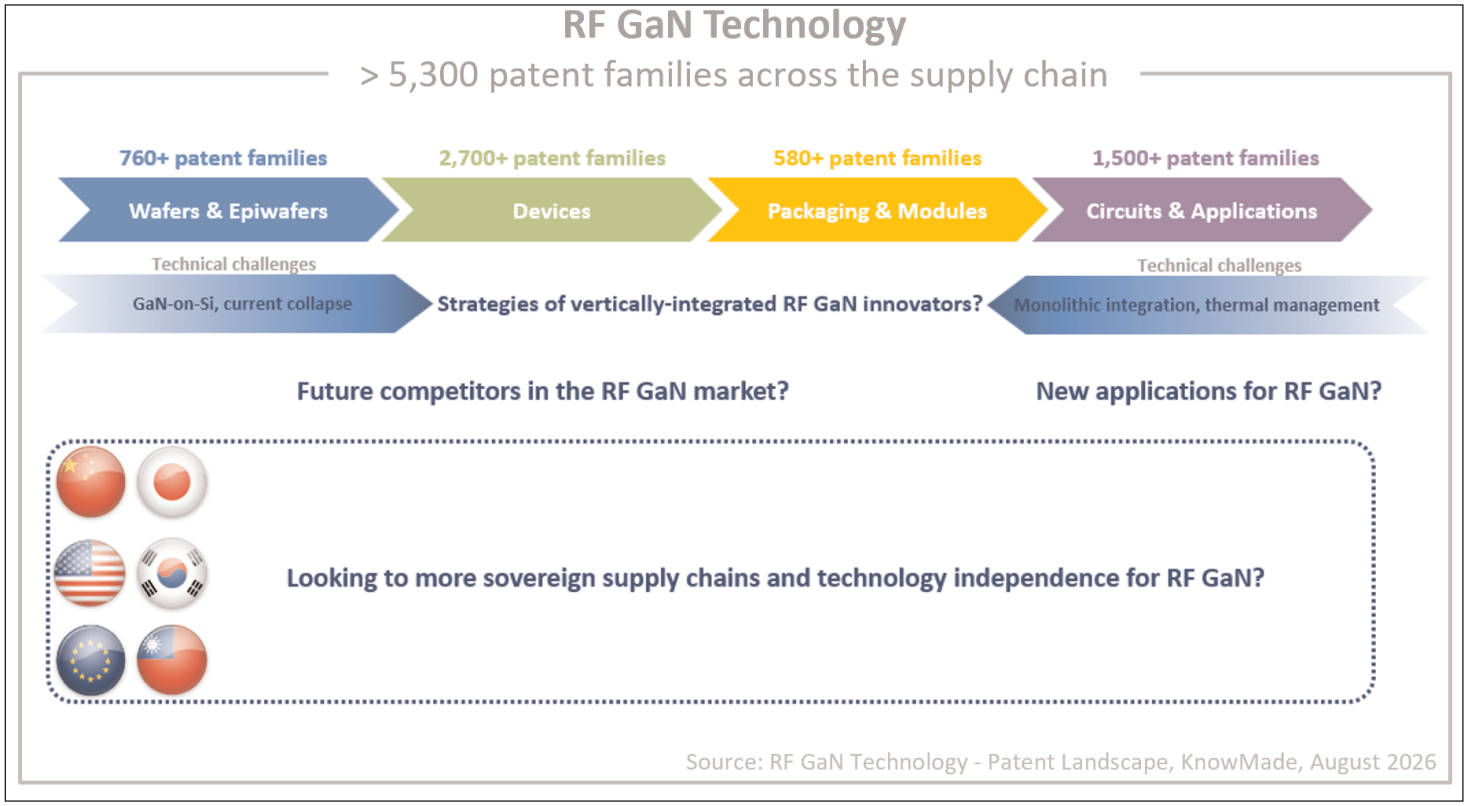


Figure 2: Distribution of RF GaN patent families across wafers & epiwafers, devices, modules & packaging, and circuits & applications.

(aluminium nitride), which aim to overcome existing thermal and performance limitations. Although their industrial adoption remains constrained by cost, manufacturing complexity and qualification requirements, patent activity can help to identify the organizations already building positions in these emerging fields.

MACOM strengthens its position while regional IP strategies evolve

Competitive IP positions remain concentrated around a limited number of established players, but the balance is shifting across the RF GaN ecosystem.

Japanese companies continue to hold strong patent positions in RF GaN wafers and epiwafers. Sumitomo Electric and NGK Insulators rank among the established leaders, while Shin-Etsu has emerged as a significant challenger. These portfolios reflect the strategic importance of substrates and epitaxy for device performance, manufacturing control and supply chain security.

US players retain a particularly strong IP position in devices and downstream technologies. Following the transfer of Wolfspeed's RF business and related patent assets, MACOM stands out for the breadth of its IP position across RF GaN devices, packaging and circuits. Its patent portfolio gives it one of the most comprehensive positions across the value chain and illustrates how acquisitions and patent transfers can rapidly reshape the competitive landscape.

China's leading RF GaN patent positions remain largely driven by state-backed organizations and academic institutions. CETC and Xidian University are particularly prominent, with Xidian University emerging as the leading domestic patent applicant in RF GaN devices. At the same time, industrial companies including Huawei, Enkris and Hanhua Semiconductor are becoming more visible, indicating a gradual diversification of China's innovation base beyond institutional applicants.

Patent protection strategies are also becoming more international. US companies are increasingly extending their filings into Europe and China, while Japanese players have expanded their patent protection in the USA and China since 2022. Europe is consequently gaining importance as a strategic patent jurisdiction, as companies seek to protect technologies in the regions where RF GaN supply chains, markets and industrial capabilities are developing.

Together, these trends point toward more direct competition across both technical segments and jurisdictions. They also underline the growing role of patents in securing access to critical technologies, protecting qualified manufacturing routes, preserving freedom to operate and strengthening negotiating positions in licensing, cross-licensing, partnerships and mergers & acquisitions. ■

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GaN HEMT short-circuit performance

Device achieves record 629µs withstanding time.

Researchers based in China claim record short-circuit (SC) performance for 650V Schottky p-GaN high-electron-mobility transistors (HEMTs) [Ning Yang et al, IEEE Transactions on Power Electronics, published online 9 July 2026]. In particular, the device achieved a record SC withstand time (t_{SC}) of 629µs under a single stress event, and was also capable of withstanding up to 12,000 repetitive SC cycles of pulses up to 50µs duration.

The team from University of Electronic Science and Technology of China (UESTC) and Shenzhen Pinghu Laboratory attribute the improved SC capability to the

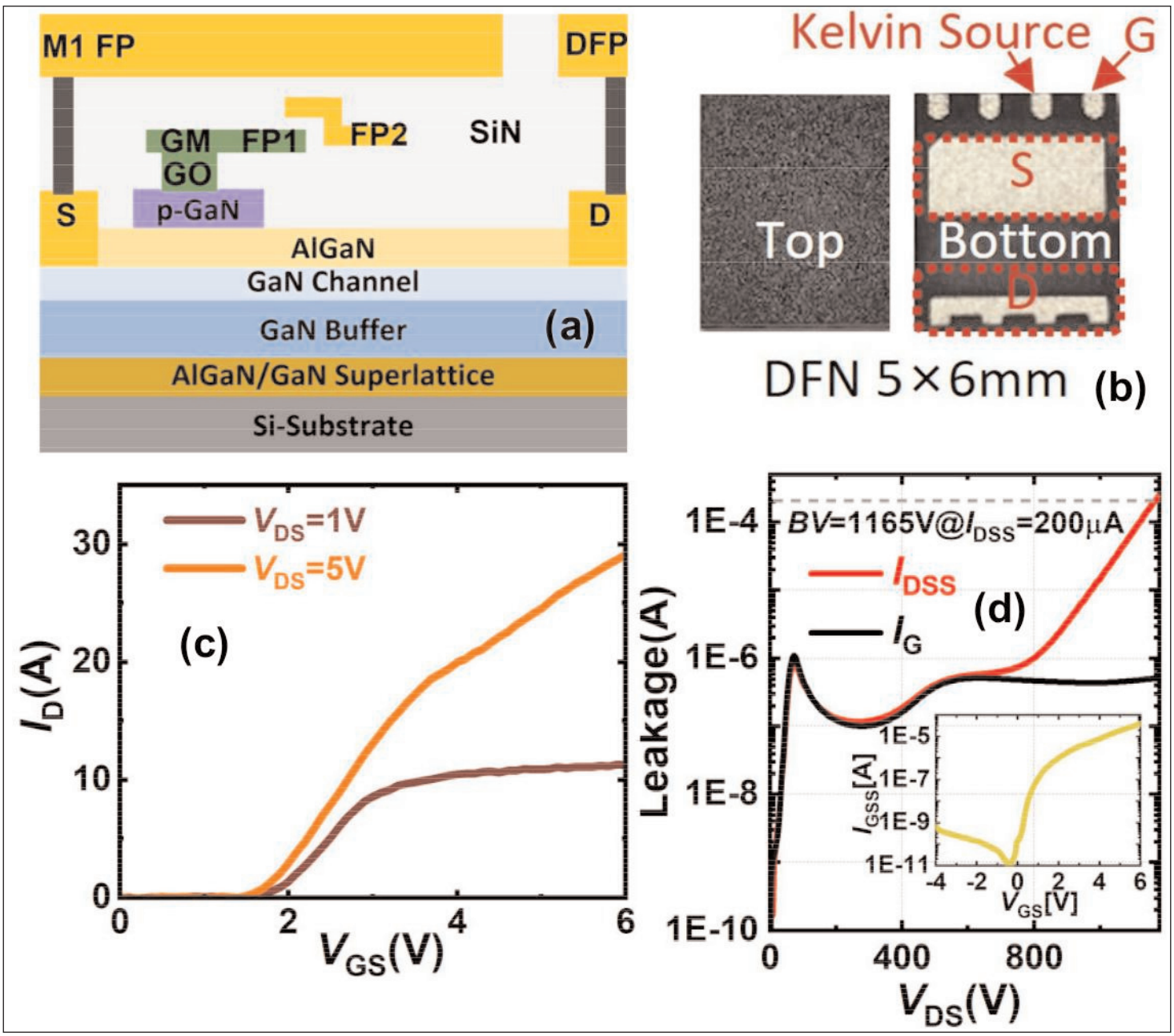


Figure 1. (a) Cross-sectional schematic of 650V enhancement (E)-mode GaN HEMTs. (b) Top and bottom views of packaged device. (c) Transfer curves, drain current (I_D) versus gate potential (V_{GS}) at 1V/5V drain biases (V_{DS}). (d) Off-state gate (I_{GSS}) and drain (I_{DSS}) leakage currents versus V_{DS}.

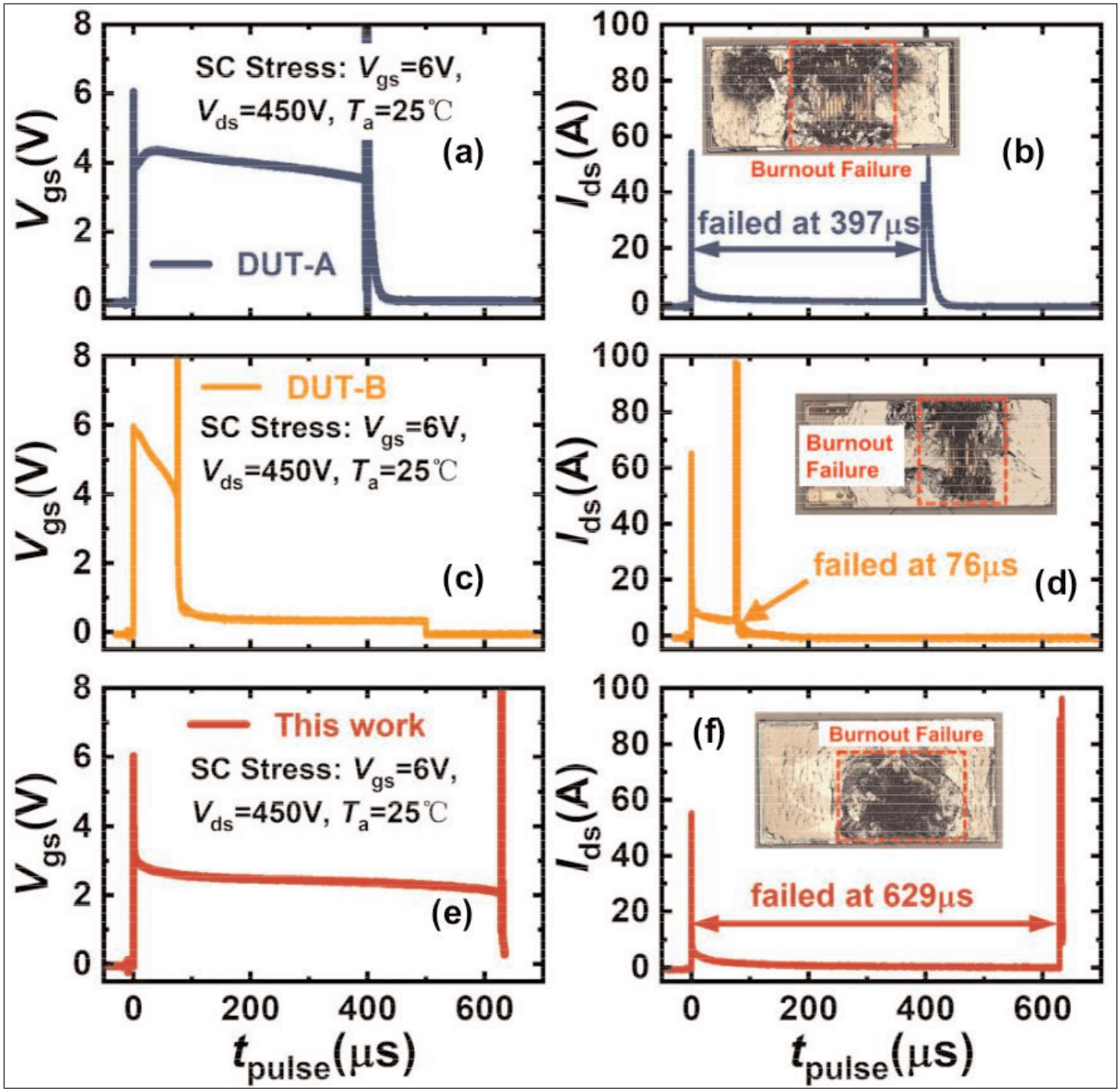


Figure 2. Single-pulse SC voltage (left) and current (right) waveforms with 450V drain stress and 6V gate potential: commercial comparison devices under test DUT-A (a, b) and DUT-B (c, d), along with Yang et al's device (e f).

use of a thinner-than-usual aluminium gallium nitride (AlGaN) barrier layer. The thinner barrier allows electrons from the channel to flow into the gate electrode during short-circuit events, adaptively reducing the gate potential, and thus partially pinching off the two-dimensional electron gas (2DEG) channel. The negative feedback reduces the drain current, mitigating self-heating effects responsible for device burnout.

The researchers see the enhanced SC robustness as enabling increased market penetration for GaN power HEMTs beyond consumer electronics applications (e.g. fast chargers) into industrial power conversion, automotive power-trains, renewable energy applications, and motor drives.

The team comments: "Short-circuit robustness of GaN HEMTs has emerged as a critical reliability concern in these applications. SC events, caused by accidental load shorting or external faults, subject devices to concurrent high drain-source voltage and current, generating excessive transient power that can induce severe degradation or catastrophic failure. This intrinsic weakness under SC stress remains a major barrier to

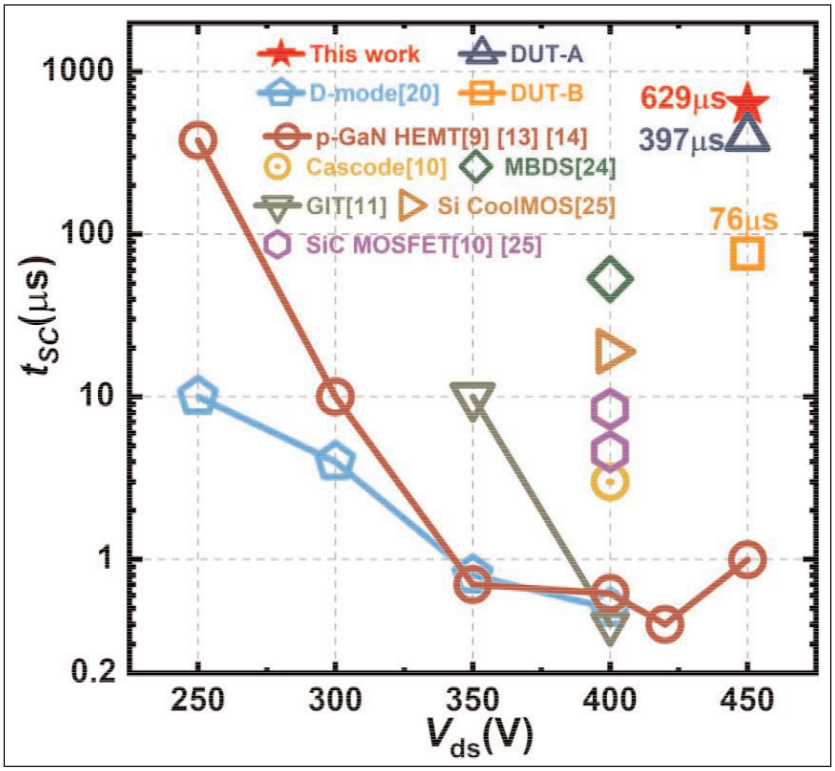


Figure 3. Benchmark of single-pulse SC capability: tSC versus Vds for 600–650V GaN power HEMTs, 650V silicon CoolMOS and 650V SiC MOSFETs.

the broader deployment of GaN HEMTs in high-reliability power electronics."

The epitaxial material for the device consisted of 6-inch silicon (Si) substrate, 2.85µm AlGaN/GaN superlattice transition layer, 1.96µm GaN buffer/channel, 11nm AlGaN barrier, and p-GaN gate (Figure 1). The gate length was 1.42µm. The fabricated device featured a number of field plates (FPs) to enable high-voltage operation by optimizing the the electric field distribution. The devices were encapsulated into dual flat no-lead (DFN) packages for testing.

The off-state breakdown voltage (BV) for a 200µA drain leakage current was 1165V. The operating characteristics included 31A saturation current at 6V gate potential, 1.15V threshold, and 89mΩ on-resistance, comparable with typical commercial devices aimed at 650V/150Ω and 700V/106mΩ operation.

Under single-pulse short-circuit stress, the device achieved a claimed record withstand time (t_{SC}) of 629µs, almost doubling that of the best of the comparison devices under test (Figure 2). Increasing the drain bias to 500V and 550V, the team found the tSC of its device reduced somewhat to 436µs and 337µs, respectively. At 550V, the comparison devices DUT-A and DUT-B only managed 0.245µs and 0.19µs, respectively.

The researchers also present a more extensive comparison against other reports, including silicon and silicon carbide (SiC) power transistors under various V_{ds} stresses (Figure 3).

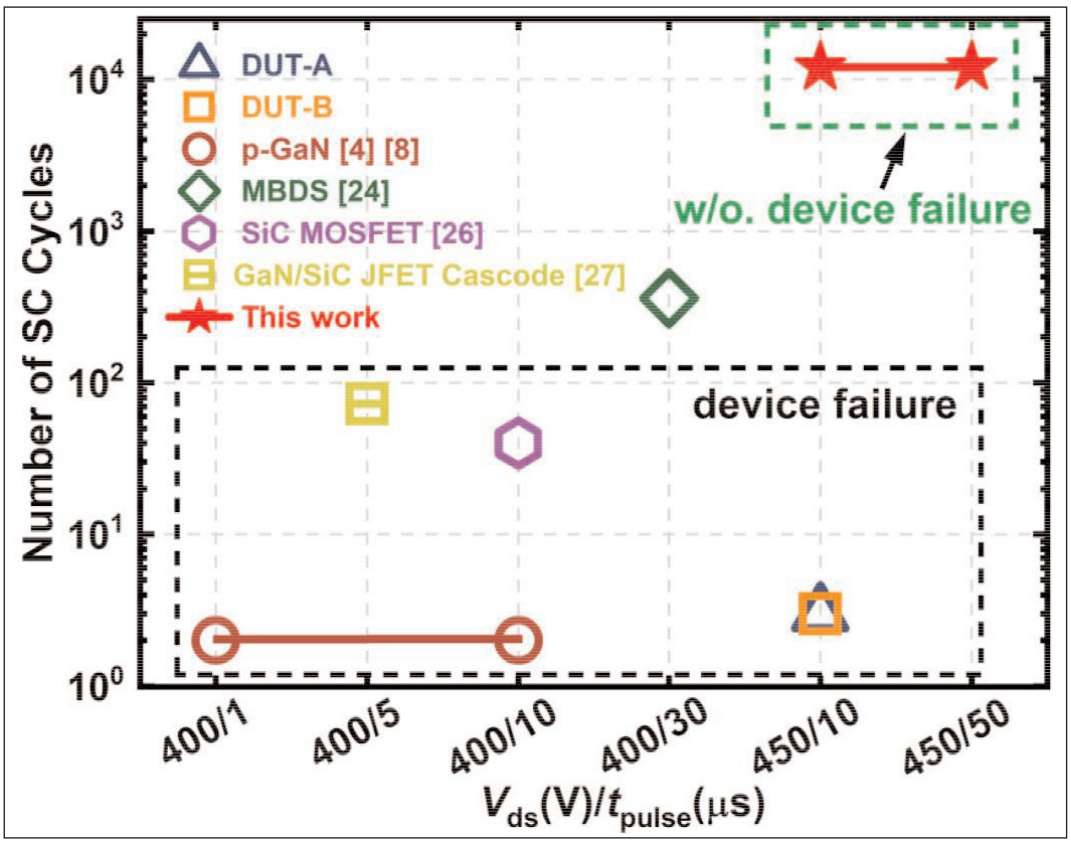


Figure 4. Benchmark of repetitive SC capability: V_{ds}/t_{pulse} versus SC cycles for 650V GaN HEMTs, 650V GaN/SiC JFET cascode and 1.2kV SiC MOSFET.

The team's device also showed superior performance under repeated shorter stress events (Figure 4). The researchers report: "Both commercial devices, DUT-A and DUT-B, failed at the third SC cycle, whereas the proposed device survived after 12,000 cycles repetitive SC stress events without device failure. Furthermore, even under a much longer SC pulse width of 50µs, the proposed device is still capable of withstanding 12,000 cycles repetitive SC stress without failure."

The endurance under the longer 50µs pulses is the first such report for GaN power devices, according to Yang et al. ■

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Author: Mike Cooke



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Jilin University achieves record 2DEG mobility for N-polar GaN/AlGaN heterostructures on SiC

Reducing high-resistance GaN template MOCVD growth temperature increases carbon incorporation and reduces oxygen concentration

Researchers at Jilin University in China have reported a significant enhancement in the two-dimensional electron gas (2DEG) mobility of nitrogen-polar (N-polar) GaN/AlGaN heterostructures grown on silicon carbide (SiC) substrates by metal-organic chemical vapor deposition (MOCVD) [Ma et al., Appl. Phys. Lett. 128, 072101 (2026)]. The team achieved a 2DEG mobility of 1947cm^2/V·s, which is claimed to be the highest value reported to date for N-polar GaN/AlGaN heterostructures on SiC.

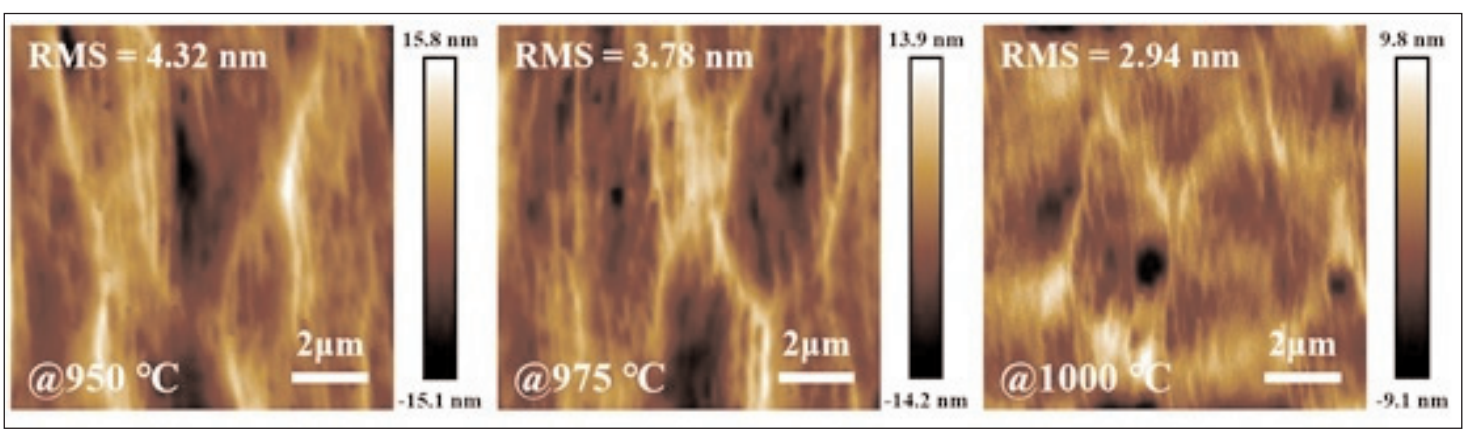
The breakthrough addresses a long-standing challenge in realizing high-performance N-polar GaN high-electron-mobility transistors (HEMTs) for high-frequency millimeter-wave applications.

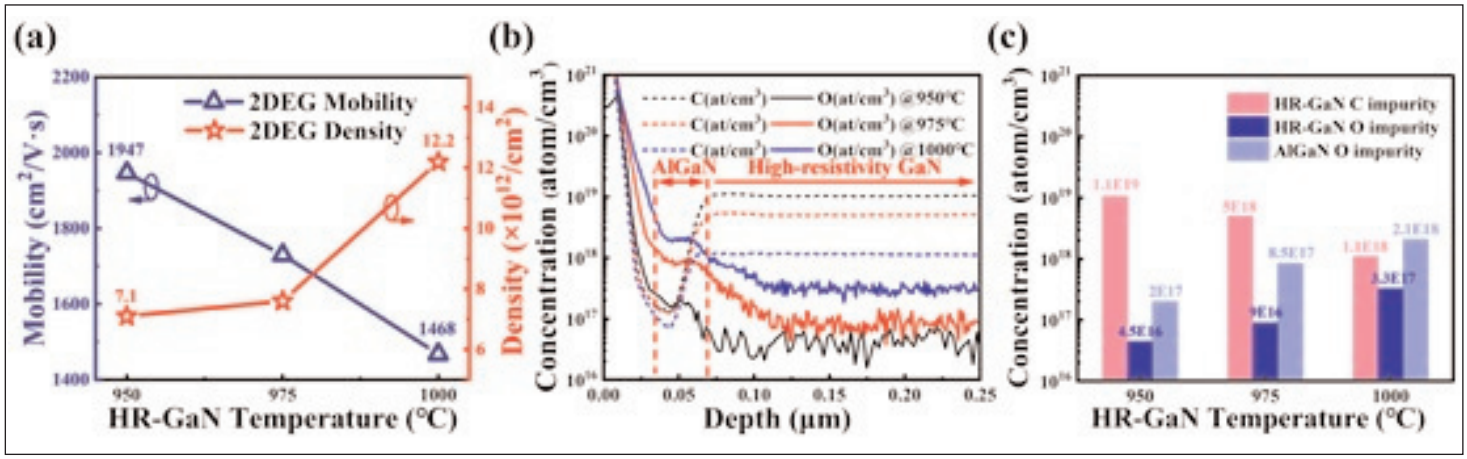
N-polar GaN HEMTs offer significant advantages over their metal-polar counterparts in the W-band (75–110GHz), with reported output power densities up to 8W/mm — nearly double that of metal-polar devices in this frequency range. However, MOCVD-grown N-polar GaN typically suffers from rougher surface morphology and substantially higher oxygen impurity concentrations (around 10^{18}cm^{-3}, one order of magnitude higher than metal-polar films), both of which degrade 2DEG mobility through interface roughness scattering and ionized impurity scattering.

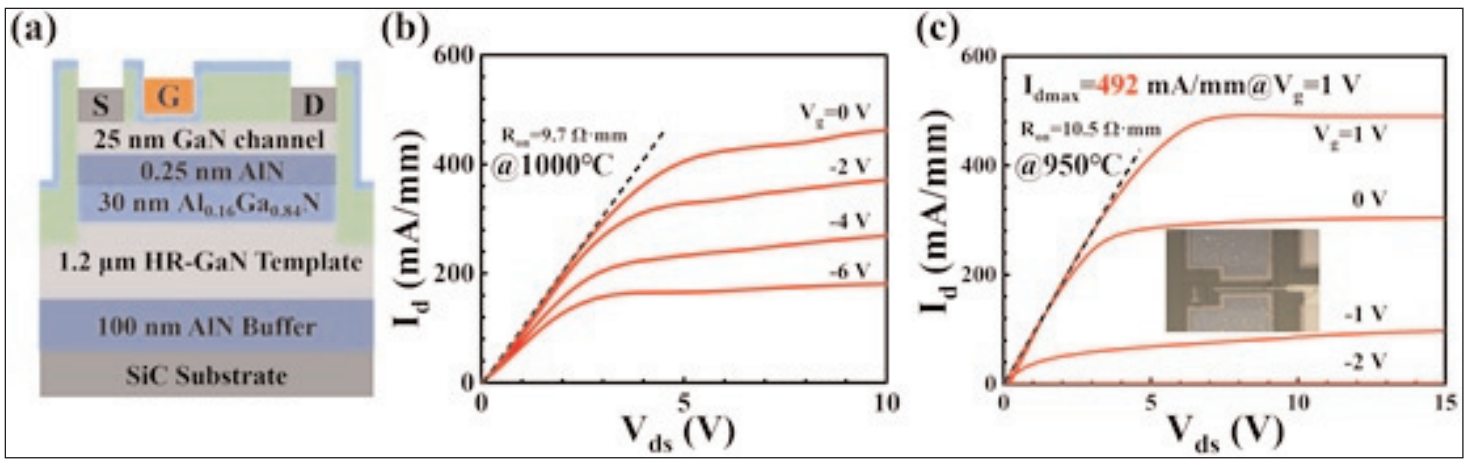
Led by corresponding author Yuantao Zhang and Gaoqiang Deng, the team tackled this problem by varying the growth temperature of the high-resistance GaN (HR-GaN) template layer between 950°C and 1000°C. Counterintuitively, while lowering the HR-GaN growth temperature increased surface roughness — root mean square (RMS) roughness over a 10x10μm^2 area rose from 2.94nm to 4.32nm — the 2DEG mobility actually improved significantly, from 1468cm^2/V·s to 1947cm^2/V·s.

Secondary-ion mass spectrometry (SIMS) analysis revealed the underlying mechanism: reducing the HR-GaN growth temperature from 1000°C to 950°C increased carbon incorporation in the HR-GaN layer by an order of magnitude (from 1.1x10^{18}cm^{-3} to 1.1x10^{19}cm^{-3}), while oxygen concentration dropped from 3.3x10^{17}cm^{-3} to 4.5x10^{16}cm^{-3}. The researchers explain that, under Ga-rich growth conditions, carbon atoms preferentially occupy nitrogen sites, competitively suppressing oxygen incorporation. The reduced oxygen concentration in the AlGaN barrier layer — which decreased from 2.1x10^{18}cm^{-3} to 2x10^{17}cm^{-3} — weakens ionized impurity scattering, the dominant mobility-limiting mechanism.

A semi-quantitative analysis based on Matthiessen's rule shows that the 10.5-fold suppression of ionized impurity scattering outweighs the 2.2-fold degradation







from increased roughness, confirming that impurity control is the dominant factor. Additionally, the higher carbon concentration in HR-GaN increases its sheet resistance from $7.8\times10^5\Omega$/sq to $9.1\times10^8\Omega$/sq, which not only suppresses leakage current but also contributes partially to the measured mobility enhancement through a parallel conduction effect.

To verify the device-level impact, the team fabricated N-polar HEMTs with HR-GaN grown at both temperatures. The device with HR-GaN grown at 950°C achieved full pinch-off at V_{GS} = −2V and delivered a saturation current density of 492mA/mm at V_{GS} = 1V, whereas the device with HR-GaN grown at 1000°C could not be fully pinched-off even at −6V due to buffer leakage.

"This work demonstrates an effective approach for enhancing the 2DEG mobility in N-polar GaN/AlGaN heterostructures, and holds significant implications for advancing high-performance N-polar GaN HEMT devices," the team concludes. ■

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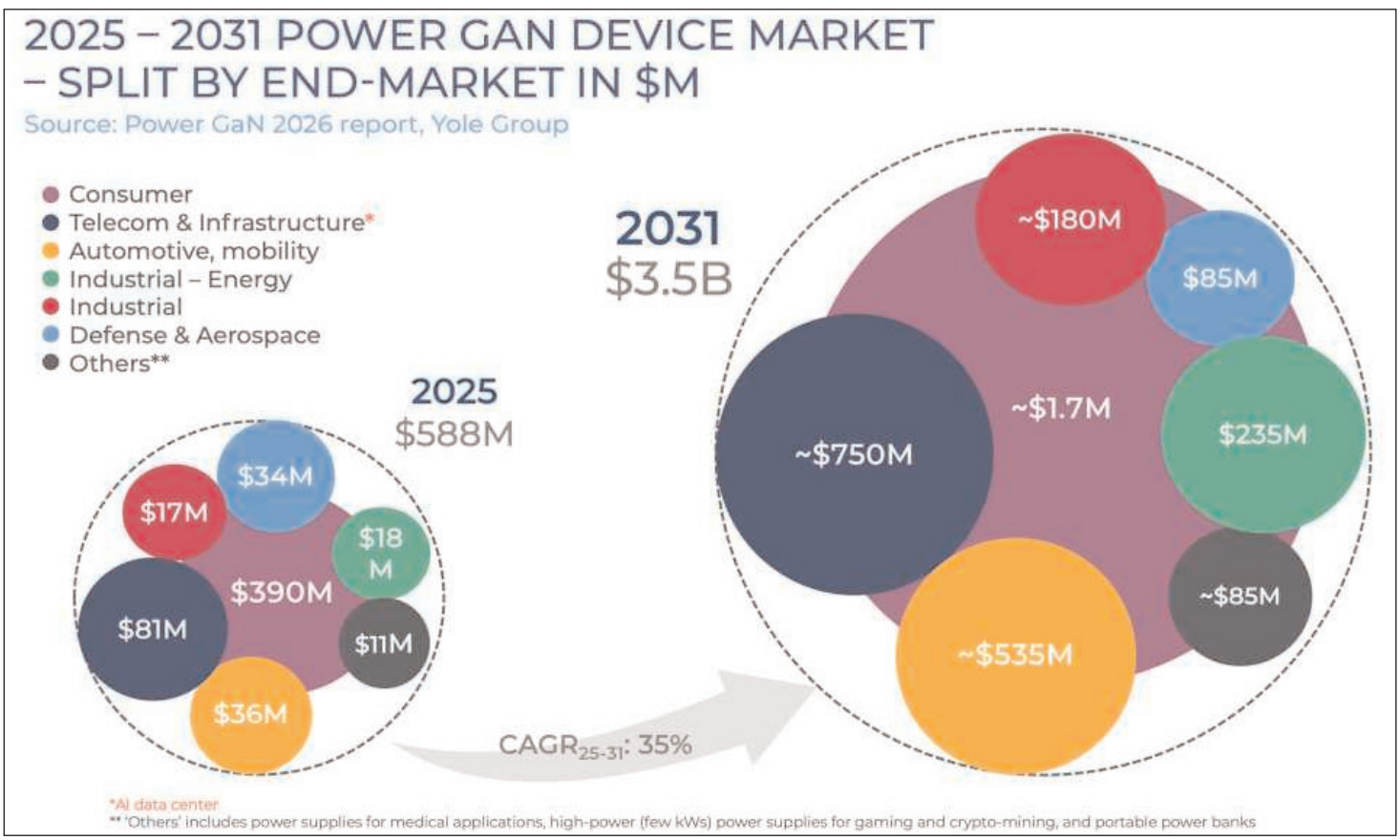
Power GaN device market growing at 35% CAGR to $3.5bn in 2031, driven by data centers, EVs and industrial systems

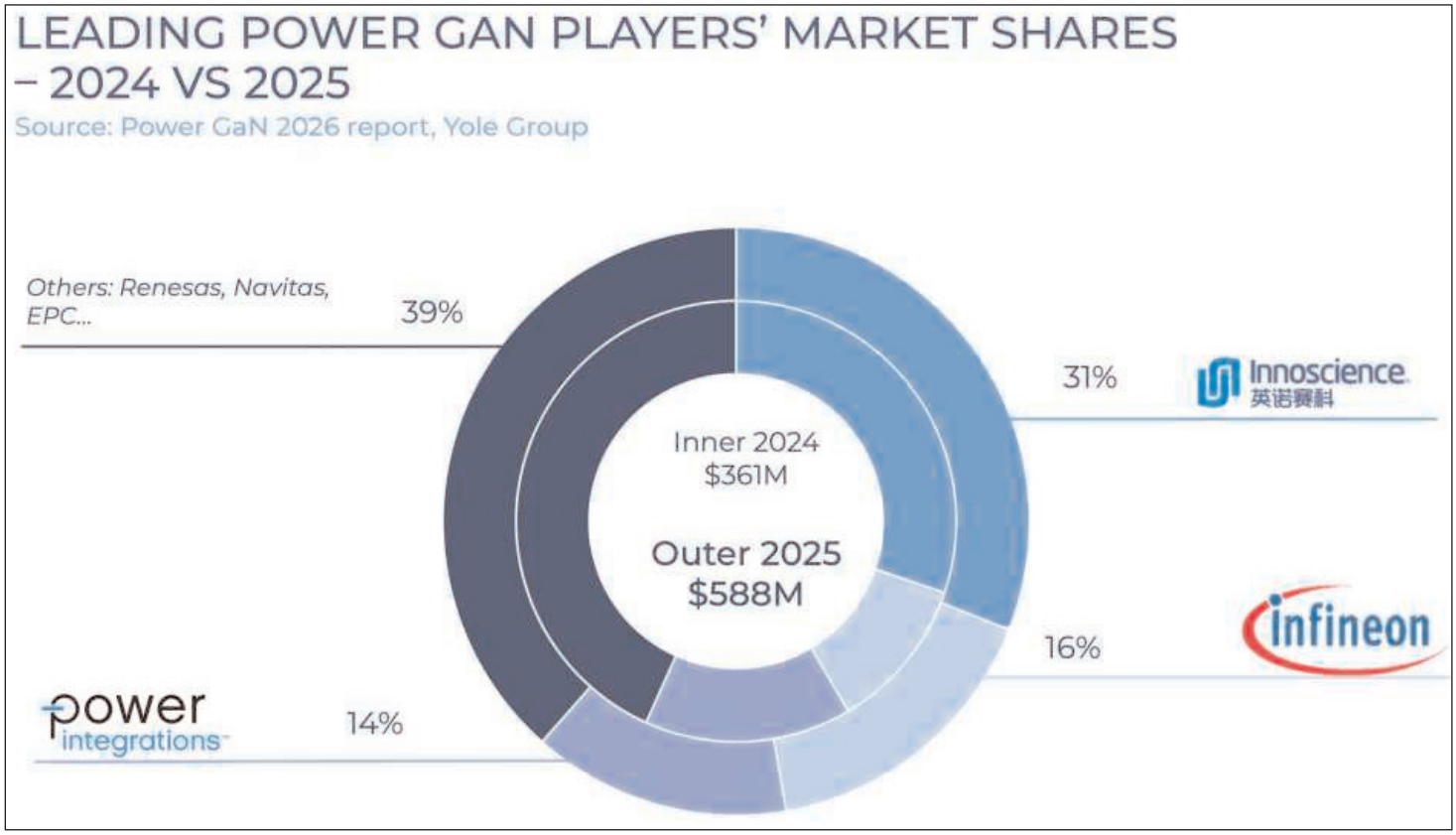
From charging to AI: power GaN devices are entering a broader, multi-market adoption cycle, says Yole.

Power gallium nitride (GaN) has spent the past several years proving itself in consumer fast chargers, but that phase is ending, according to Yole Group's annual report 'Power GaN 2026'. GaN is now entering a broader, multi-market adoption cycle where AI data centers, electric vehicles, industrial systems, and renewable energy all become meaningful demand drivers. For chipmakers, foundries and investors, understanding where this next wave of growth is concentrated and which companies are positioned to capture it is critical to strategic planning over the next five years.

"For years, power GaN's story was almost entirely about the phone charger in your pocket. That's no longer the full picture," notes Roy Dagher PhD, technology & market analyst, Compound Semiconductors. "AI infrastructure is opening a second, arguably bigger chapter for this technology, and it's moving fast."

Consumer and mobile electronics remain the market's anchor segment by revenue, expected to reach $1.7bn





in 2031 due to continued fast-charger and appliance adoption. But the sharpest growth curve belongs to automotive, where onboard chargers and emerging 48V architectures push the segment to a compound annual growth rate (CAGR) of 57%, and to telecom/infrastructure, where AI-driven data-center demand drives a 45% CAGR to $750m.

Further out, humanoid robots stand out as a potential growth engine beyond 2030. Actuator drives and battery management in a humanoid platform all call for high power density within tight weight and thermal budgets – the conditions where GaN's efficiency and small form factor matter most. Volumes are negligible today but, if humanoid platforms reach commercial scale in the 2030s, they would add a demand pool distinct from consumer, automotive and data-center applications.

GaN competition proliferating as adoption spreads

The competitive landscape is shifting too. Innoscience held the top spot in 2025 and continues to widen its footprint into automotive and data centers. Infineon posted the year's sharpest gains on the back of data-center and renewable energy wins, and Renesas kept expanding across multiple fronts. Navitas took a different path, deliberately trading share in low-margin fast-charging for a foothold in higher-value segments.

onsemi is the most significant new entrant: it moved into power GaN by collaborating with GlobalFoundries on 650V devices built on a 200mm GaN-on-silicon platform, alongside a parallel wafer-supply arrangement with Innoscience, with customer sampling starting in first-half 2026 and AI data centers, EVs and renewable energy as its stated targets.

Behind the leaders, a fast-growing group of suppliers — ROHM, Texas Instruments, STMicroelectronics, Nexperia, and Chinese entrants including GaNext and Southchip — is picking up share as GaN spreads to more corners of the industry.

Manufacturing base diversifying

The manufacturing shift is one of the report's central findings. Rather than consolidating around a single dominant foundry, the industry is fragmenting productively: GlobalFoundries has licensed GaN technology from TSMC and is qualifying production in the USA, Taiwan-based Vanguard International Semiconductor Corp (VIS) and Powerchip Semiconductor Manufacturing Corp (PSMC) are absorbing volume as customers move off TSMC, and Samsung, DB HiTek, and SK Keyfoundry are each building early GaN capabilities in South Korea. At the same time, IDMs including Infineon, Renesas, onsemi, STMicroelectronics, ROHM and Nexperia continue to invest in their own capacity and vertical integration, often through acquisition.

"TSMC stepping back from GaN foundry work could have been read as a warning sign for the industry. Instead, it's turning into one of the clearest signals of how much this ecosystem has matured," says Poshun Chiu, principal technology & market analyst, Semiconductor Substrates & Materials, at Yole Group. "Other foundries are moving in fast, and the manufacturing base is coming out more distributed than before." ■

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Fax: +1 716 833 2926
www.williams-adv.com

Matheson Tri-Gas
6775 Central Avenue,
Newark, CA 94560, USA
Tel: +1 510 793 2559
Fax: +1 510 790 6241
www.mathesontrigas.com

Nouryon Functional Chemicals B.V.
Zutphenseweg 10, 7418 AJ
Deventer,
The Netherlands
Tel. +31 652 478554
https://hpmo.nouryon.com

Praxair Electronics
542 Route 303,
Orangeburg, NY 10962,
USA
Tel: +1 845 398 8242
Fax: +1 845 398 8304
www.praxair.com/electronics

Vital Thin Film Materials (Guangdong) Co Ltd (Vital Materials subsidiary)
18G, 18th Floor, Shenzhen Free
Trade Centre, No.111 Taizi Road,
Nanshan District,
Shenzhen, Guangdong, China 518067
Tel: (+86) 0755-21651348
sales@vitaltfm.com

www.vitaltfm.com
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6 Deposition equipment

AIXTRON SE
Dornkaulstr. 2,
52134 Herzogenrath,
Germany
Tel: +49 2407 9030 0
Fax: +49 2407 9030 40
www.aixtron.com

ETC (LPE subsidiary)
Via Falzarego, 820021 Baranzate (Mi),
Italy
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)
Am Hügel 2, D-01458
Ottendorf-Okrilla,
Germany
Tel: +49 35205 520-0
E-mail: sales@fhr.de
E-mail: sales@vitalchem.com
www.fhr.biz
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20021 Baranzate (Mi), Italy
Tel: +39 02 383 41 51
Fax: +39 02 383 06 118
www.lpe-epi.com

PLANSEE High Performance Materials
6600 Reutte,
Austria
Tel: +43 5672 600 2422
info@plansee.com
www.plansee.com

Plasma-Therm LLC
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USA
Tel: +1 727 577 4999
Fax: +1 727 577 7035
www.plasmatherm.com

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95873 Bezons Cedex,
France
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Fax: +33 (0) 1 39 47 45 62
www.riber.com

SVT Associates Inc
7620 Executive Drive,
Eden Prairie, MN 55344,
USA
Tel: +1 952 934 2100
Fax: +1 952 934 2737
www.svta.com

Temescal, a division of Ferrotec
4569-C Las Positas Rd,
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USA
Tel: +1 925 245 5817
Fax: +1 925 449-4096
www.temescal.net

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

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

SPTS Technology Ltd
Ringland Way, Newport NP18 2TA,
Wales, UK
Tel: +44 (0)1633 414000
Fax: +44 (0)1633 414141
www.spts.com

SUSS MicroTec AG
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85748 Garching, Germany
Tel: +49 89 32007 0
Fax: +49 89 32007 162
www.suss.com

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1024 Ecublens,
Switzerland
Tel +41 21 694 35 00
Fax +41 21 694 35 01
www.synova.ch

TECDIA Inc
2700 Augustine Drive, Suite 110,
Santa Clara, CA 95054 ,
USA
Tel: +1-408-748-0100
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
Tel: +43 5672 600 2422
info@plansee.com
www.plansee.com

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USA
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www.tecdia.com

10 Gas and liquid handling equipment

Cambridge Fluid Systems
12 Trafalgar Way, Bar Hill,
Cambridge CB3 8SQ,
UK
Tel: +44 (0)1954 786800
Fax: +44 (0)1954 786818
www.cambridge-fluid.com

CS CLEAN SOLUTIONS GmbH
Fraunhoferstrasse 4,
Ismaning, 85737,
Germany
Tel: +49 89 96 24000
Fax: +49 89 96 2400122
www.csclean.com

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Fax: +1 978 436 6735
www.entegris.com

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Bridgwater, Somerset TA6 5JJ, UK
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Fax: +44 (0)1278 420666
www.iemtec.com

Vacuum Barrier Corporation
4 Barton Lane,
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USA
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Tel: +1 602 282 1000
www.versummaterials.com

11 Process monitoring and control

Conax Technologies
2300 Walden Avenue,
Buffalo, NY 14225,
USA
Tel: +1 800 223 2389
Tel: +1 716 684 4500
www.conaxtechnologies.com

k-Space Associates Inc
2182 Bishop Circle
East, Dexter, MI 48130,
USA
Tel: +1 734 426 7977
Fax: +1 734 426 7955
www.k-space.com

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CA 95035, USA
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Fax: +1 408 875 4144
www.kla-tencor.com

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www.vacuumbarrier.com

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WEP (Ingenieurbüro Wolff für Elektronik- und Programmentwicklungen)
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

J.A. Woollam Co. Inc.
645 M Street Suite 102,
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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,
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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

ePAK International Inc
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
www.gelpak.com

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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Tel: +44 (0) 1698 722072
www.cstglobal.uk

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Fort Washington,
PA 19034,
USA
Tel: +1 215 784 6000
Fax: +1 215 784 6001
www.kns.com

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Tel: +1 760 931 3600
Fax: +1 760 931 5191
www.PalomarTechnologies.com

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MA 01501, USA
Tel: +1 508-832-3456,
Fax: +1 508-832-0506
www.pi.ws
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
Tel: +1 858 674 4676
Fax: +1 8586 74 4681
www.quikicpak.com

18 Chip foundry

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4 Stanley Boulevard, Hamilton International Technology Park,
Blantyre, Glasgow, G72 0BN,
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

RENA Technologies NA
3838 Western Way NE,
Albany, OR 97321, USA
Tel: +1 541 917 3626
www.rena-na.com

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20 Facility consumables

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MD 21921-4236,
USA
Tel: +1 410 392 4440
Fax: +1 410 506 8749
www.gore.com

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

Semiconductor Technology Research Inc
10404 Patterson Ave.,
Suite 108, Richmond,
VA 23238,
USA
Tel: +1 804 740 8314
Fax: +1 804 740 3814
www.semitech.us

22 Used equipment

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www.riff-co.com

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Contact Person: Cathy W. Hung
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24 Resources

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IEEE Energy Conversion Congress & Expo (ECCE 2026)
Vancouver, British Columbia, Canada
E-mail: info@ieee-ecce.org
www.ieee-ecce.org/2026

4–9 October 2026
29th European Microwave Week (EuMW 2026)
Excel, London, UK
E-mail: eumweek@mcon-mannheim.de
www.eumw.eu

13–15 October 2026
SEMICON West 2026
Moscone Center, San Francisco, CA, USA
E-mail: semiconwest@semi.org
www.semiconwest.org

14–17 October 2026
49th International Semiconductor Conference (CAS 2026)
Hotel Sinaia, Sinaia, Romania
E-mail: cas@imt.ro
www.imt.ro/cas

19–21 October 2026
Global Photonics, Optics and Lasers Conference (GPOLC2026)
Radisson Blu Hotel, Dubai Deira Creek, Dubai, UAE
E-mail: gpolc2026@synergiasummits.com
https://gpolc2026.synergiasummits.com

26–28 October 2026
13th IEEE Workshop on Wide Bandgap Power Devices and Applications (WiPDA 2026)
Burlington, Vermont, USA
E-mail: NKim@ieee.org
https://wipda.org/

5–8 November 2026
4th IEEE International Power Electronics and Application Conference and Exposition (PEAC 2026)
Suzhou, China
E-mail: peac@cpss.org.cn
www.peac-conf.org

8–13 November 2026
12th International Workshop on Nitride Semiconductors (IWN 2026)
Kumamoto, Japan
E-mail: info@iwn2026.org
www.iwn2026.jp

13–15 November 2026
AMSE 2026: the 7th International Conference on Advanced Materials Science and Engineering
Kyoto, Japan
E-mail: amse_secretary@yeah.net
www.amse.net

15–20 November 2026
SC26 Conference
McCormick Place, Chicago, IL, USA
https://sc26.supercomputing.org

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16–19 November 2026
The Sixth International Symposium on 3D Power Electronics Integration & Manufacturing (3D-PEIM 2026)
Tempe, AZ, USA
www.3d-peim.org

12–16 December 2026
72nd annual IEEE International Electron Devices Meeting (IEDM 2026)
Hilton San Francisco Union Square, San Francisco, CA, USA
E-mail:IEDM@maritz.com
www.ieee-iedm.org

14–18 February 2027
2027 IEEE International Solid- State Circuits Conference (ISSCC 2027)
San Francisco, CA USA
E-mail: Issccinfo@yesevents.com
www.isscc.org

3–5 March 2027
Asia Photonics Expo (APE 2027)
Level 1, Sands Expo and Convention Centre (Marina Bay Sands), Singapore
E-mail: visitors-ape@informa.com
www.asiaphotonicsexpo.com

7–11 March 2027
Optical Fiber Communication Conference and Exposition (OFC 2027)
Los Angeles Convention Center, Los Angeles, CA, USA
E-mail: ofc@mcievents.com
www.ofcconference.org

7–11 March 2027
IEEE Applied Power Electronics Conference and Exposition (APEC 2027)
New Orleans, Louisiana, USA
E-mail: apec@apec-conf.org
www.apec-conf.org

30 March–1 April 2027
SEMICON West 2027
Phoenix Convention Center, Phoenix, AZ, USA
E-mail: semiconwest@semi.org
www.semiconwest.org

18–22 April 2027
SPIE Defense + Security 2027
Orlando, FL, USA
E-mail: customerservice@spie.org
www.spie.org/conferences-and-exhibitions/defense-and-security

27–29 April 2027
30th Annual Components for Military & Space Electronics Conference & Exhibition (CSME 2027)
Renaissance Los Angeles Airport Hotel, CA, USA
E-mail: info@tjgreenllc.com
www.tjgreenllc.com/cmse

11–13 May 2027
PCIM 2027 (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

23–26 May 2027
12th International Conference on Power Electronics — ECCE Asia (ICPE 2027 — ECCE Asia)
Coex Magok, Seoul, South Korea
E-mail: secretary@icpe-conf.org
www.icpe-conf.org/

23–28 May 2027
IEEE/MTT-S International Microwave Symposium (IMS 2027)
San Antonio, TX, USA
E-mail: exhibits@horizonhouse.com
https://ims-ieee.org

1–4 June 2027
IEEE 77th Electronic Components and Technology Conference (ECTC 2027)
Gaylord Rockies Resort & Convention Center, Denver, CO, USA
E-mail: registration@ectc.net
www.ectc.net

13–17 June 2027
IEEE 39th International Symposium on Power Semiconductor Devices and ICs (ISPSD 2027)
TICC, Taipei, Taiwan
E-mail: secretariat@ispsd2027.com
www.ispsd2027.com

12–17 September 2027
IEEE Energy Conversion Congress and Exposition (ECCE 2027)
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