SSIA
Singapore Semiconductor Industry Association

SINGAPORE SEMICONDUCTOR VOICE

Volume 39 • July 2025 • T05SS0291A

SSIA
Singapore Semiconductor Industry Association

STRENGTHENING LOCAL ECOSYSTEM

MOU Bolsters Singapore-Indonesia Semiconductor Collaboration

SSIA and Indonesia's KADIN have signed an MOU to deepen semiconductor cooperation, expand SME market access, and reinforce Singapore-Indonesia ties—positioning ASEAN as a stronger, connected regional semiconductor hub. Read all about it on page

Semiconductor Tradewinds: June 2025 – Singapore Rises Amid Global Growth

Driven by AI demand and eased tariff tensions, the semiconductor sector shows strong H1 growth. Singapore emerges as a key beneficiary, securing major investments and expanding its global manufacturing footprint.

Leadership in Engineering #5 bringing Insights from Industry Trailblazers

At SSIA's fifth leadership run, GlobalFoundries' Tan Yew Kong and AEM's Amy Leong inspired participants with lessons on leadership, empathy, and courageous decision-making to drive innovation and authentic leadership.

Follow us

Singapore Semiconductor Industry Association

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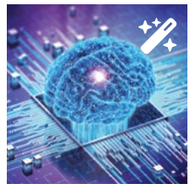
Joining the Singapore Semiconductor Industry Association (SSIA) opens a world of business opportunities

SSIA IS YOUR GATEWAY

Blending unparalleled network access and strategic growth opportunities into a single membership

Network Expansion:

Dive into a vast industry network through exclusive business networking and supplier development sessions, designed to forge valuable connections and partnerships.



Branding and Marketing Leverage:

Broaden your outreach and enhance your visibility through diverse marketing opportunities - such as in our top industry VOICE publication - and a complimentary listing on the SSIA website.

Insight and Influence:

Gain access to the latest developments and government policies affecting the sector, while also having a platform to voice your feedback directly to key industry and government leaders.

Exclusive Training Opportunities:

Enjoy priority enrolment in specialized semiconductor-focused training and courses, keeping your team at the forefront of industry advancements.

Advocacy and Growth:

Benefit from SSIA's proactive advocacy efforts, ensuring your business's interests are represented, while also contributing to the vibrancy and growth of Singapore's semiconductor ecosystem.

Why be an SSIA member?

For both SMEs and MNCs in the semiconductor sector, SSIA membership offers a dynamic platform for growth, influence, and strategic connections, accelerating your business's success in Singapore and beyond by fostering key industry partnerships, providing insights into policy and development, and enhancing visibility within the global semiconductor ecosystem.

SSIA WELCOMES NEW MEMBERS

CADFEM

Endress+Hauser
People for Process Automation

OKMETIC

pba SYSTEMS

porvair filtration group

TransPak

FOREWORD BY THE EXECUTIVE DIRECTOR

As we enter the second half of 2025, the world remains as volatile as ever.

From the escalating conflict in the Middle East to the prolonged war in Ukraine, and the ripple effects of ongoing trade tensions driven by rising national interests and shifting geopolitical alignments, businesses across the globe are navigating a climate of profound uncertainty. For our semiconductor industry, this means disrupted supply chains, shifting customer expectations, and a recalibration of global strategies. While these headwinds may weigh heavily in the short term, they have also reminded us of a timeless truth: in uncertain times, collaboration is our greatest strength.

This is why the theme of this year's Semiconductor Business Connect, ***"Strengthening Collaborations, Building Resiliency,"*** could not be more timely. This platform, born out of the vision to connect MNCs with our local ecosystem, has matured into a powerful movement that enables knowledge exchange, strategic partnerships, and growth for companies of all sizes. And once again this year, we are heartened by the strong participation and support from across the industry, both local and regional. Business Connect is more than an event. It is a symbol of our collective ambition to thrive together.

Even amidst uncertainty, the demand for semiconductor chips continues to grow. This sector, so often viewed as merely technical or transactional, is increasingly becoming a symbol of unity. An ambassador for collaboration across businesses, borders, and beliefs. If chips are the building blocks of the digital world, then our collaboration is the spirit that gives it meaning. In today's fractured world, our industry can and must be the force that brings people together.

Beyond platforms like Business Connect, SSIA remains deeply committed to developing the future of our industry. This year, we are proud to roll out the **Singapore Semiconductor Leadership Excellence (SSLE)** programme, the next chapter of the successful SSLA. Developed in partnership with Singapore Management University (SMU), SSLE is designed to equip our next generation of leaders with the agility, foresight, and resilience to navigate an increasingly complex landscape. We are grateful for the strong support from the industry. If your organisation is looking to invest in its high-potential leaders, I encourage you to reach out to the SSIA Secretariat to learn more.

We are also proud to support the **Workforce Transformation Award (WTA)**, an initiative by **Workforce Singapore (WSG)** in collaboration with **SSIA**. Now in its second year, the WTA recognises and celebrates companies and individuals in the electronics industry who have demonstrated exceptional commitment to workforce transformation. It is a meaningful way to spotlight the bold actions taken by industry leaders to future-proof their workforce, empower their people, and build resilience from within. Nominations for this year's WTA are now open, and the award will be presented during the Semiconductor Dinner on 24 September. I encourage all companies and individuals making strides in workforce transformation to step forward and share your story. To submit a nomination, please visit SSIA website.

And finally, this year is not just about looking ahead, but also about celebrating how far we've come. **SSIA marks its 20th anniversary in 2025**, and we invite you to join us for a grand celebration at **Resorts World Sentosa** on **24 September 2025** during the **SSIA Summit and Semiconductor Dinner**. It will be a night to remember, as we reflect on two decades of progress and look forward to what the next 20 years may bring. Companies interested in supporting or participating in these events are warmly invited to reach out to us. We would love to have you on this journey.

Let us stay united, stay bold, and keep building not just semiconductors, but a better future for all.

ANG WEE SENG
Executive Director
Singapore Semiconductor Industry Association (SSIA)

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SSIA SUMMIT AND SEMICONDUCTOR DINNER 2025

24 SEPT

24 September 2025
SSIA Summit: 9:00AM–4:00PM
Semiconductor Dinner: 7:00PM–10:00PM
Resorts World Sentosa

SSIA Summit & Semiconductor Dinner 2025 is Singapore's premier semiconductor event, bringing together industry leaders, innovators, and policymakers.

SSIA Summit
Featuring keynotes, panel discussions, and networking opportunities, addressing the latest trends and challenges.

Semiconductor Dinner
An exclusive gala celebrating industry achievements and fostering connections. Join us to gain insights, collaborate, and shape the future of semiconductors.

To participate as a sponsor, contact us at secretariat@ssia.org.sg

JOIN US

FORGING REGIONAL RESILIENCE:

SSIA AND KADIN ESTABLISH PARTNERSHIPS IN SEMICONDUCTOR

In a time of heightened geopolitical uncertainty and shifting supply chain dynamics, industry associations are stepping up - not only as advocates but as active facilitators of strategic collaboration.

Singapore Semiconductor Industry Association (SSIA) has formalised a Memorandum of Understanding (MOU) with the **Indonesian Chamber of Commerce and Industry (KADIN)**. This partnership marks a significant step in strengthening regional collaboration between two of Southeast Asia's most dynamic economies and underscores the growing importance of ASEAN as a critical, connected semiconductor hub.

This business-to-business partnership aims to expand market access for local companies in both countries by fostering closer ties between Singapore and Indonesia's semiconductor and electronics ecosystems. Through initiatives such as business facilitation, joint events and industry roundtables, the agreement serves to unlock new opportunities—particularly for SMEs—and strengthen regional supply chain resilience.

This partnership is particularly timely. As the global semiconductor industry seeks to diversify supply chains, Southeast Asia offers new opportunities. For Singapore companies seeking to build new customer relationships, identify suppliers, or explore partnerships in the region, it offers a practical and direct platform to do so.

This partnership also reflects SSIA's evolving role over the past two decades. SSIA has consistently supported companies in Singapore's semiconductor landscape, helping members grow networks, share insights, and build business relationships. The MOU with KADIN is a natural extension of this mission. It opens new doors for industry-led collaboration, particularly for SMEs, and reflects a growing interest among companies in both countries to explore complementary capabilities and markets.

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LEADERSHIP IN ENGINEERING RUN #5:

IGNITING THE LEADER WITHIN

From May 6–8, 2025, the SSIA Leadership in Engineering Programme returned for its fifth run: A three-day immersive experience designed to elevate leadership from the inside out. With participants drawn from across the semiconductor value chain, the workshop offered more than just skills training.

A Cross-Sector Catalyst for Change

What sets this programme apart is its diversity. Curated by the Singapore Semiconductor Industry Association (SSIA) in collaboration with EQ Strategist, the course brings together professionals from across the semiconductor ecosystem, from fab to equipment, design to packaging. This intentional cross-pollination fosters richer discussions, broader insights, and collaborative approaches to industry-wide challenges.

Led by transformation coach Dominic Siow, the sessions are rooted in neuroscience, high-performance strategies, and experiential learning. The result? A dynamic, high-trust environment where people don't just learn; they evolve.

Day 1: Leading Self

The programme kicked off with a high-energy session by EQ Strategist and welcome remarks from SSIA Executive Director Ang Wee Seng, setting the tone for a deep dive into personal leadership.

Participants explored the theme of "Leading Self" — focusing on authenticity, emotional resilience, and inner clarity. A standout session by **Tan Yew Kong**, SVP & GM, Singapore Site, GlobalFoundries Singapore, reframed leadership as an act of trust and kindness rather than control. He emphasized the shift from micromanagement to "micro-leadership," encouraging participants to lead with empathy and intention.

Yew Kong Tan, SVP & GM, Singapore Site, GlobalFoundries Singapore, breaking down the difference between micromanagement and micro-leadership — and why kindness is a leadership superpower.

Day 2: Leading Others

Day 2 focused on building the skills to inspire and empower teams. Dominic Siow led transformational exercises on outcome-driven leadership rooted in purpose and clarity.

The highlight was an uplifting keynote by **Amy Leong**, CEO of AEM Holdings. She spoke on the importance of connection, courageous decision-making, and asking the right questions to drive innovation. Her personal reflections on balance and wellbeing grounded the conversation in authenticity.

Amy Leong, CEO of AEM Holdings, shares her philosophy on courageous leadership, network-building, and the power of asking the right questions.

Participants then dove into hands-on workshops with Andrew Davey and Sue Siow, applying concepts like stakeholder engagement, influence, and empathy through interactive games and reflective exercises.

Day 3: Leading Forward

The final day was a celebration of growth, connection, and renewed vision. Participants reflected on their learning journey and committed to applying their insights within their teams and organisations.

The collective energy throughout the three days was palpable — filled with openness, trust, and a genuine desire to lead with both heart and head.

Ready for Your Turn?

Leadership in Engineering Run #6 is now open for sign-ups and will take place from **29–31 July 2025**. Whether you're an aspiring leader or a seasoned professional seeking fresh perspectives, this is your opportunity to gain practical tools, grow your network, and lead with intention.

To learn more and register, visit:
https://ssia.org.sg/leadership-programmes/

Spaces are limited — don't miss your chance to be part of this transformational experience!

Let's continue to build leaders who uplift, innovate, and inspire across the semiconductor value chain.

SEMI TECH ZOOMER BOOTCAMP 2025 KICKS OFF

The SEMI Tech Zoomer University Bootcamp 2025 brought together 140 undergraduates from Singapore, Malaysia, and Vietnam for a five-day deep-dive into the semiconductor industry. Supported by the Singapore Semiconductor Industry Association (SSIA), this immersive programme aims to build future-ready talent for one of the world's most critical industries.

Singapore's student cohort includes representatives from the National University of Singapore (NUS), Nanyang Technological University Singapore (NTU), Singapore University of Technology and Design (SUTD), and Singapore Institute of Technology (SIT) - a diverse mix eager to explore opportunities in the fast-evolving tech landscape.

Keynote Insights

On 19 May, the bootcamp opened with remarks from:

- **Shan Loy**, Global Workforce Development Programme Director, SEMI SEA
- **Caryn Gill**, Regional VP, Australasia & SEA, Singapore Global Network
- **Ivah Sugiarti**, Head of Human Capital Development, SSIA

Their insights painted a compelling picture of the semiconductor sector's future, workforce needs, and regional outlook, setting the stage for the rest of the week.

Industry Panel Discussion

A highlight of the day was the panel discussion on **"Workforce Development Trends and Jobs Outlook for the Semiconductor Industry."**

Speakers included:

- **Avinash Srinivasan**, **PhD**, Senior MDE Manager, **KLA Corporation**
- **Nicole Kong**, HR Director, **Lam Research**, and SEMI SEA WFD Council Member
- **Sylvia Chan**, Director, **GlobalFoundries**

They offered real-world advice on career pathways, skills in demand, and how students can stand out in a competitive landscape.

Beyond The Classroom

The week's agenda goes far beyond talks and panels. Students engaged in:

- **Hands-on workshops** to build technical competencies
- **Industrial visits** for firsthand exposure to semiconductor operations
- A **personal profiling session** focused on resumes and interview prep

These activities are designed to bridge classroom knowledge with real-world application and prepare participants for future careers in the industry.

Growth. Exposure. Inspiration.

The SEMI Tech Zoomer Bootcamp offers students a rare chance to gain cross-cultural exposure, practical insights, and a deeper understanding of a vital global industry. With support from regional leaders and companies, it's a springboard for students to connect, grow, and begin charting their paths in the semiconductor world.

Here's to an exciting journey ahead—shaping tomorrow's talent, today.

SINGAPORE AND THE NETHERLANDS TAKE A STRATEGIC STEP FORWARD IN PHOTONIC CHIP TECHNOLOGY

At Semicon Southeast Asia, Singapore showed again that it can bring global tech communities together. During the tradeshow, PhotonDelta signed an MoU with SSIA, starting the next phase of a strong partnership in Photonic Integrated Circuits (PICs) between Singapore and the Netherlands. In the same week, a delegation of over 20 delegates from companies and universities in the Netherlands joined an innovation mission to explore international collaboration opportunities in integrated photonics. The group was supported by PhotonDelta, RVO and the Netherlands Embassy.

Our shared ambition

The partnership between PhotonDelta and SSIA underscores the shared ambition to accelerate the development of Photonic Chip technology and its applications and marks a pivotal moment in PhotonDelta's efforts to strengthen ties with one of the most vibrant semiconductor and technology hubs in Asia.

Through this MoU, PhotonDelta and SSIA will foster closer collaboration between Dutch and Singaporean stakeholders with a clear focus on PICs, enabling knowledge exchange, joint innovation, and deeper ecosystem connectivity. Singapore's robust semiconductor sector, renowned for its manufacturing and technological depth, offers many opportunities for innovation in Photonic Chip technology. The Netherlands provides a unique proposition through its strong R&D infrastructure, specialised application companies, and advanced manufacturing capabilities.

Bringing the ecosystem together

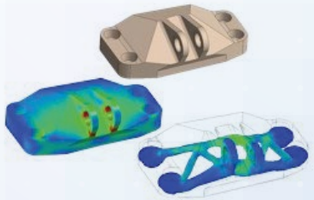
Looking to Europe, the next major integrated photonics events will be PIC Summit 2025, held on 4–5 November in Eindhoven, the Netherlands. Organised by PhotonDelta, the event serves as the key PIC event in the region and will provide a venue to explore business, technology, and collaboration opportunities for both ecosystems. Singaporean stakeholders are warmly invited to attend and engage with European partners.

The collaboration with SSIA does not end here. PhotonDelta looks forward to joining Asia Photonics Expo 2026 and we are excited to explore the programme around PICs.", says Florian Federer, Business Development Manager Asia at PhotonDelta. "These continued engagements are vital for reinforcing our relationships, building momentum, and ensuring that Photonic Chip technology remains at the forefront of technological innovation, in both Europe and Asia."

This partnership represents more than just shared goals - it reflects a joint commitment to shaping the future of Photonic Chip technology on a global scale. We look forward to growing this collaboration in years to come.

STRENGTHENING SINGAPORE'S SEMICONDUCTOR ECOSYSTEM THROUGH LOCAL INNOVATION AND COLLABORATION

Singapore's semiconductor industry is undergoing a transformative phase, driven by strategic collaborations across government agencies, academia, SMEs, and MNCs. A key enabler of this evolution is the country's focus on developing domestic manufacturing capabilities—particularly through advanced technologies like metal and polymer 3D printing—which reduces reliance on external supply chains and strengthens production agility.



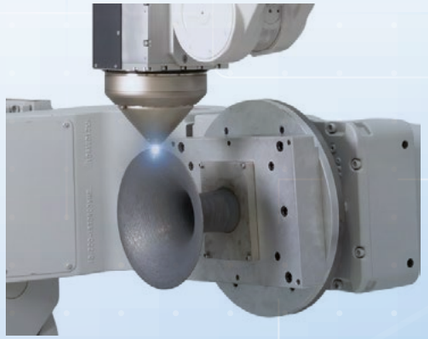
One such contributor to this growing local ecosystem is ELH Tech, a homegrown SME founded in 2009. Our company offers precision CNC machining, reverse engineering, and hybrid production services. Combining 3D printing with CNC machining enables faster, more precise, and cost-effective mass production. Thus, reducing waste, improving flexibility, and transforming traditional manufacturing into a smarter, hybrid production process for semiconductor parts.

This local capacity for agile and customizable production provides Singapore a strategic edge in responding to fast-changing global semiconductor demands. By leveraging additive manufacturing, companies like ELH Tech enhances speed-to-market while maintaining high standards of quality and precision.

Beyond industry players, government agencies and academia play a pivotal role in nurturing talent and advancing innovation. Initiatives by the Economic Development Board (EDB) have fostered meaningful partnerships, such as those between the Institute of Technical Education (ITE) and global leaders like GlobalFoundries and Micron. These collaborations focus on equipping local talent with skills in next-generation manufacturing techniques—including additive manufacturing—ensuring a future-ready workforce.

Singapore's continued investments in R&D and infrastructure underscore its commitment to building a robust ecosystem. The Agency for Science, Technology and Research (A*STAR), for example, plays a vital role in advancing manufacturing technology, ensuring that local enterprises remain globally competitive and innovation-driven.

In conclusion, Singapore's cohesive strategy—anchored in local production, advanced technologies, talent development, and cross-sector collaboration—is laying the foundation for a resilient and thriving semiconductor ecosystem. ELH Tech exemplify how SMEs can lead in driving this transformation, as Singapore continues to solidify its global leadership in semiconductor innovation.



Mr. Simon Si, Technical Director
Founder of ELH TECH PTE. LTD.

ELH TECH

MURATA:

BUILDING TOMORROW'S INNOVATORS TODAY

Our Story

For over 50 years, Murata Electronics Singapore has served as a strategic innovation hub, bridging affiliates across the ASEAN and India regions, solidifying our role as your reliable partner in technological advancement. While we are known for our comprehensive range of high-quality technological products and solutions, what truly sets Murata apart is our incredible regional network of talented individuals who work together to bring concepts into reality through extensive design and research, empowering your next creation.

As the global leader in module and component supply, Murata goes beyond technology to actively invest in the future talent pipeline critical for the sustained growth of the semiconductor industry. We understand our responsibility to the local communities and our stakeholders. That is why we are deeply committed to advancing society through various initiatives.

One of our key social initiatives focuses on nurturing the next generation of innovators by igniting young adults' interest in the semiconductor industry and broadening their views on STEAM (Science, Technology, Engineering, Arts, and Mathematics) fields.

Nurturing Future Generations

On 28th May 2025, Murata Electronics Singapore demonstrated this commitment by hosting students and staff from Kent Ridge Secondary School, alongside representatives from the Singapore Semiconductor Industry Association (SSIA), for a special Work Experience Program.

The visit to our Tuas factory, which specializes in lithium-ion battery production, offered students an insightful plant tour and an engaging safety tour at our very own Safety Centre. These experiences provided a firsthand look into modern manufacturing processes, showcasing the advanced, comfortable, and safe work environments that redefine traditional perceptions of the industry.

By opening our doors to these young minds and highlighting our cutting-edge manufacturing, we aim to spark curiosity and reshape perceptions about the electronics and manufacturing sectors. As we actively work to attract top young talent to critical roles, we are fostering a more robust and skilled future for the entire regional ecosystem. We hope that witnessing how their studies translate into real-world applications will inspire them to consider rewarding careers in these dynamic fields.

Our commitment to nurturing talent and creating a positive, enriching environment for all stakeholders is deeply ingrained in our operations. This dedication has proudly earned us recognition as Singapore's Best Employer for three consecutive years, underscoring the strength and reliability of our workforce and partnerships.

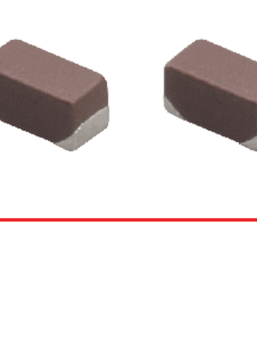
TOGETHER WITH THE SEMICONDUCTOR INDUSTRY:

ENABLING A SUSTAINABLE FUTURE THROUGH CONTINUOUS INNOVATIONS

Murata's leadership is especially evident across its innovative product portfolio:

1.Murata Silicon Capacitors

Designed with semiconductor-grade precision, these capacitors deliver ultra-low ESL, high reliability, and excellent thermal performance—ideal for space-constrained, high-frequency applications like optical communication systems.

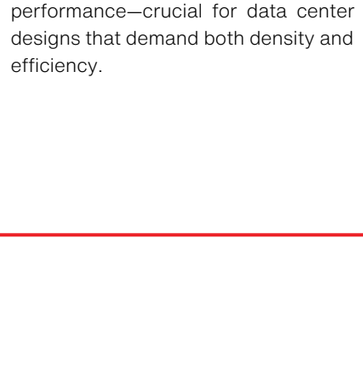


2.Murata EMI Products (BHL Series)

With superior noise suppression and EMI filtering, the BHL series ensures clean signal paths and electromagnetic integrity within dense server and networking platforms.

3. Murata POSISTOR (PTC Thermistor)

To mitigate the risks caused by heat generation from high current, overheating detection functions are needed. Murata's PTC PRF series enables multi-point overheating detection in AI servers with high GPU power consumption, using a simple design that requires only one IC port, enhancing reliability and reducing heat-related risks.



4.Murata iPaS™ (Integrated Passive Solutions)

By integrating multiple passive components into compact modules, **iPaS™** technology saves valuable board space while enhancing signal performance—crucial for data center designs that demand both density and efficiency.

*As AI and cloud technologies drive digital transformation, the demand for energy-efficient, high-performance data centers continues to soar. Semiconductor innovation lies at the core of this evolution—and **Murata, as an innovator in electronics**, delivers cutting-edge solutions that address the industry's critical needs for power management, signal integrity, and miniaturization. Murata contributes meaningfully to this transformation by offering advanced electronic components that support the miniaturization, thermal stability, and signal clarity essential to next-generation data infrastructure. Through continuous technological breakthroughs, Murata empowers the industry to build scalable, high-speed, and sustainable data center environments.*

muRata
INNOVATOR IN ELECTRONICS

COMPANY AND WORKFORCE TRANSFORMATION:

OPTIMISATION ESSENTIALS FOR PRACTICE (CLASSROOM AND ASYNCHRONOUS E-LEARNING)

A Newly Launched Optimization SkillsFuture Singapore-Funded Training Course in Singapore, organized by Gurobi and Singapore Polytechnic

Overview

- **Course Date:**

  2 Sep 2025 (asynchronous e-learning)

  16 Sep 2025 to 17 Sep 2025 (in-person)

- **Registration Period:**

  4 Jun 2025 to 18 Aug 2025

- **Duration/Frequency:**

  Tue - Wed 9am - 6pm | Singapore Polytechnic

- **Mode of Training:**

  E-learning and Classroom

- **Venue:**

  Online and Singapore Polytechnic

This course, offered by Singapore Polytechnic, aims to introduce practitioners to the fundamentals of mathematical optimisation problems and demonstrate how generative AI (GenAI) tools can support the modelling and decision-making processes in such problems.

Participants will learn to formulate real-world optimisation problems as mathematical models, solve these models using gurobipy (the Gurobi Python interface), and use the results to guide strategic decision-making.

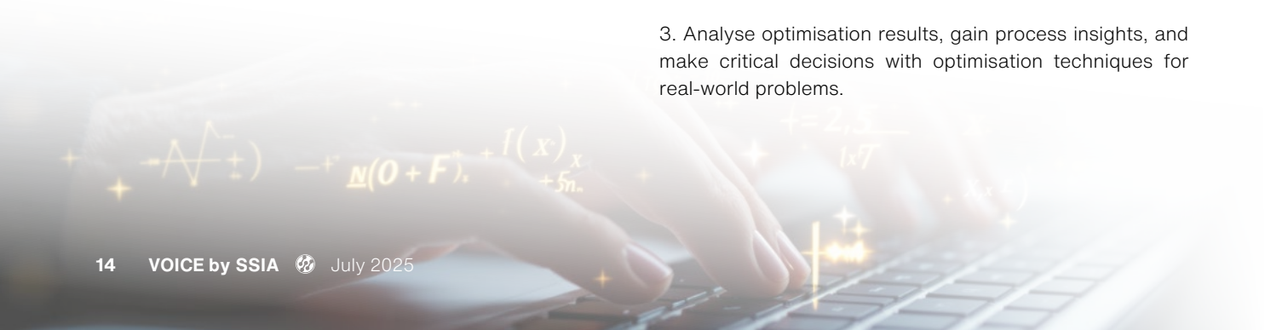
The course also explores the use of GenAI in generating, verifying, and refining both models and code. By integrating essential theory with practical code-appreciation exercises, the course equips participants with the skills to apply optimisation techniques effectively within their organisational context.

By the end of the course, participants will be able to:

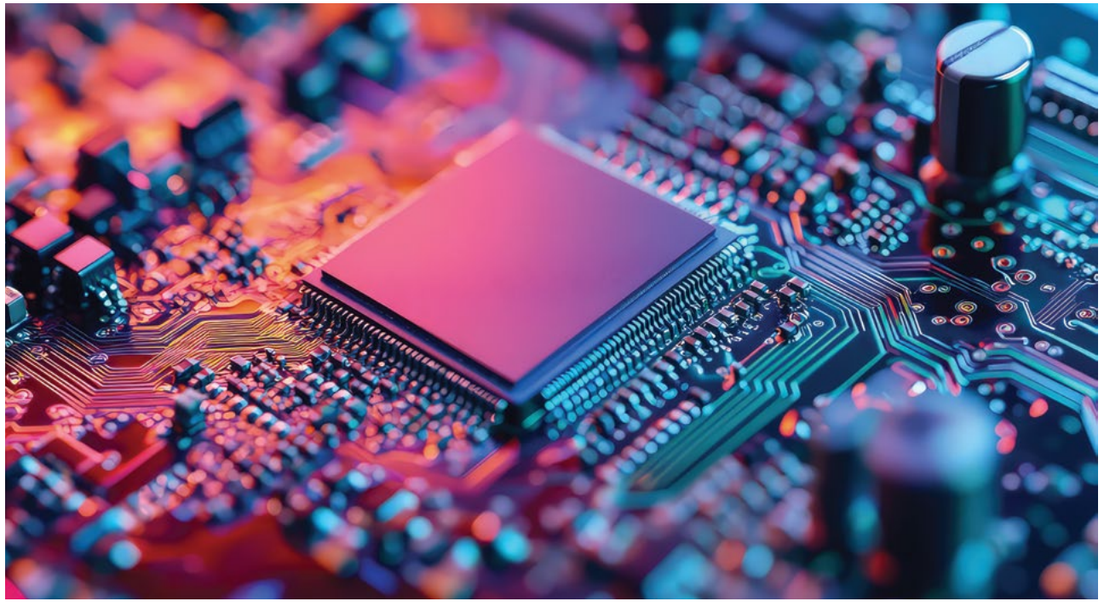
1. Formulate, solve, and interpret optimisation problems in areas like linear programming and integer programming for informed decision-making.

2. Leverage GenAI to enhance optimisation processes, such as transforming formulated models into executable code.

3. Analyse optimisation results, gain process insights, and make critical decisions with optimisation techniques for real-world problems.



Business & Innovation Focus



Topics to be covered

- **Gurobi's Zero-to-Hero Online Course on Optimisation** (offered in asynchronous e-learning mode).
- **Model formulation, objective functions, constraints, parameters, decision variable Concepts** (in-person).
- **Selected small-scale case studies to reinforce the Application of concepts** (in-person).
- **Modelling, code generation, and execution** (in-person).
- **Introduction and demonstration of solutioning processes with generative AI platforms** (in-person).
- **Modelling and Code Generation with Generative AI Platform** (in-person).

Participants who complete this course successfully will receive a certificate of completion, jointly awarded by Singapore Polytechnic and Gurobi Optimization. They will also enjoy three months of free access to a Gurobi license.

Our training course runs several times a year and is open to employees from all organizations. We can also organize exclusive runs of the course, accessible only to employees from a specific company.

For more details on course fees, upcoming course dates or to register your interest in an exclusive company run, please refer to the course details at ***https://for.edu.sg/oefp*** or scan the QR code below.

For questions, please reach out to Shireen Ong at ***Shireen.ong@gurobi.com*** *or Dr Martin Ruediger STROBEL at* ***Martin_Ruediger_STROBEL@sp.edu.sg***

SP Singapore Polytechnic | SP Data Science & Analytics Centre | GUROBI OPTIMIZATION

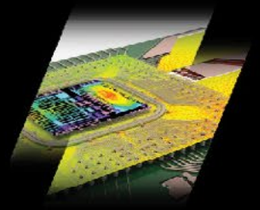
Ansys

Ansys Semiconductor

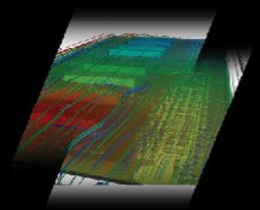
SOLUTIONS

Ansys provides multiphysics analysis and simulation solutions for signoff power integrity, thermal integrity, and signal integrity of integrated circuits (IC), multi-die 2.5/3D-IC packages, interposers, printed circuit boards (PCBs), and full systems.

3D-IC Electrothermal Analysis

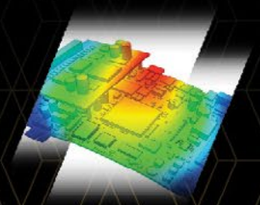


Chip-Package-Board System Analysis



High-Speed Interface Analysis

Multiphysics Signoff



Delivering Quantified Business Impact

Performance Improvement

10x ↑

Design Cycle Time Reduction

66% ↓

Cost Reduction

30% ↓

About Ansys

When visionary companies need to know how their world-changing ideas will perform, they close the gap between design and reality with Ansys simulation. For more than 50 years, Ansys software has enabled innovators across industries to push boundaries by using the predictive power of simulation. From sustainable transportation to advanced semiconductors, from satellite systems to life-saving medical devices, the next great leaps in human advancement will be powered by Ansys.

Take a leap of certainty... with Ansys.

Ansys Singapore Private Limited, 9 Raffles Place #26 - 01, Republic Plaza,Singapore, 048619, Singapore
info-asean@ansys.com, www.ansys.com

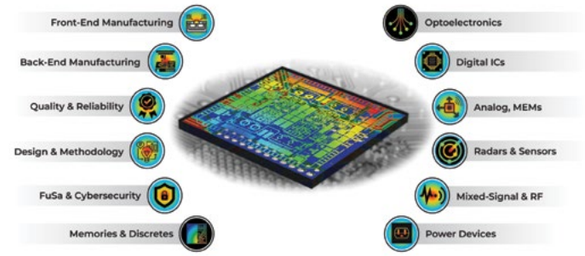
The semiconductor industry is undergoing a transformative shift driving next-gen technology innovations across industries such as consumer electronics, automotive, aerospace & defense, and many others. This evolution is powered by advances in compute and storage capabilities, breakthroughs in networking and communication, and innovations in semiconductor packaging, manufacturing, and fabrication. The demand for faster, more efficient, and highly integrated systems is pushing the boundaries of technology, driving companies to rethink how they design and manufacture their products.

Semiconductor design is going through an inflection point as engineers face two significant challenges: The first is the ongoing march of Moore's Law into advanced finFET process technology below 5nm. We see new transistor architectures like nanosheet gate-all-around (GAA) and back-side power delivery. The second challenge relates to multi-die design, 2.5D/3D-IC packaging, and heterogeneous integration. Leading design teams have adopted these advances as they face various multiphysics challenges to succeed with 3D-IC. New multiphysics challenges include

- Thermal analysis and prototyping
- Electromagnetic coupling (EMC/EMI)
- Reliability issues from thermo-mechanical Stress & Warpage of multi-die assemblies

Simulation plays a key role in addressing these challenges, enabling rapid prototyping, optimizing designs, and streamlining engineering processes while ensuring desired performance and efficiency. By leveraging simulation, companies can accelerate technology innovation and design, reduce cost and time-to-market, and strengthen their competitive edge in the fast-evolving landscape of next-gen semiconductor products.

Simulation Solutions for the Semiconductor Industry



Ansys solutions provide unparalleled capacity to speed up completion times for even the largest finFET integrated circuits (IC) and 3D/2.5D multi-die systems. These powerful multiphysics analysis and verification tools reduce power consumption, improve performance and reliability, and lower project risk with foundry-certified golden signoff verification.

- Power integrity (EM/IR) analysis
- Perceived EMI/EMC
- Co-packaged Optics
- Electrothermal analysis of 2.5D/3D multi-die systems
- Electrostatic discharge (ESD) and reliability analysis
- RTL power analysis
- On-silicon electromagnetic analysis

With strong R&D, advanced digital engineering, government support (RIE2025 and other initiatives), talent development, and a skilled workforce, Singapore is well-poised to become a leading hub for semiconductor innovation. Ansys provides advanced simulation solutions to assist its customers across MNCs, SMEs, academia, and government in Singapore by strengthening local R&D capabilities for creating a robust and thriving ecosystem in the semiconductor industry.

Ansys

TACKLING WATER AND ENERGY CHALLENGES IN SEMICONDUCTOR MANUFACTURING

Driven by the rise of GenAI, data centre expansion, and increasing demand for advanced chips across the automotive, IoT, and healthcare sectors, the global semiconductor industry is growing at an unprecedented pace. Southeast Asia, particularly Singapore, is actively positioning itself to capture higher-value segments of this fast-evolving sector.

For semiconductor manufacturers and fab operators, the pressure is twofold: to scale production reliably and efficiently, while meeting increasingly stringent climate targets at both corporate and national levels.

Grundfos earns Platinum EcoVadis rating

In June 2024, Grundfos achieved the Platinum medal rating from EcoVadis. This recognition places Grundfos in the 99th percentile of companies rated worldwide, showcasing our unwavering commitment to sustainable business practices.

Sustainability at the core

Water has always been the heart and soul of Grundfos, a global leader in pump and water solutions with 80 years of heritage. The company believes in the transformative power of water. Sustainability is not only a business imperative but deeply embedded in the company's purpose: to pioneer solutions to the world's water and climate challenges and improve quality of life for people.

Helping semiconductor manufacturers navigate water and energy challenges is more than a market opportunity. It is a vital part of Grundfos' commitment to driving sustainable impact through innovation and partnerships.

Leveraging its global expertise in pumps and water solutions, combined with a deep understanding of semiconductor manufacturing, Grundfos helps manufacturers optimise water and energy use across the following application areas.

Water intake:
- Pre-treatment and make-up water
- Ultra-pure water (UPW) feed and transfer
- Customised pumps that comply with stringent water purity requirements

Cooling:
Intelligent and high efficiency solutions for substantial water and energy savings

Wastewater treatment and water reuse:
Intelligent pumps for decentralised integration and control of membrane filtration and reverse osmosis systems

Service offerings:
Control and monitoring, optimised processes, greater energy efficiency and improved asset reliability

The power of partnership

In 2022, Grundfos became the world's first water solutions company with a validated science-based net-zero target, committing to net-zero emissions by 2050. With nearly 99% of its emissions stemming from the use phase of its products, partnerships are central to this ambition. By working closely with customers, Grundfos delivers energy-efficient and intelligent water and climate solutions that help optimise resource use and reduce carbon footprints, advancing both customer goals and its own.

Beyond technology, Grundfos actively leverages its influence to advocate for collective action, working with governments, NGOs, industry peers, and platforms such as the UN Global Compact, UN CEO Water Mandate, C40 Cities, and the World Economic Forum.

In the semiconductor sector, Grundfos has joined SEMI's global water management working group to co-develop energy- and water-efficient solutions and support industry-wide sustainability education.

Joining the SSIA is a natural extension of Grundfos' commitment to meaningful partnerships in Singapore and beyond. Grundfos looks forward to engaging with fellow SSIA members through this platform to collectively support the sustainable development of Singapore's semiconductor industry.

Grundfos Received "Water Technology Company of the Year" Award 2024

Eric Lai,
VP/Regional Managing Director, IND – APAC&China

Amidst growing water and climate pressures and global uncertainty, partnership is key to the semiconductor sector's progress. Through SSIA, we look forward to meaningful collaboration to help strengthen Singapore's semiconductor ecosystem for the long term.

Scan to learn more

GRUNDFOS
Possibility in every drop

THE SILENT ENABLER OF SEMICONDUCTOR SUCCESS ~ A CONNECTED WORLD

As Singapore strengthens its role in the global semiconductor value chain, one vital enabler continues to work quietly but critically behind the scenes—precision logistics. At Sin Chew Woodpaq, we ensure that the most delicate, high-value semiconductor tools are packed, moved, and delivered safely, swiftly, and seamlessly.

Singapore's local semiconductor ecosystem thrives on synergy between talent, technology, and infrastructure. At Sin Chew Woodpaq, we invested in all three.

Our work begins long before the first machine is moved. We engineer reusable packaging that protects, use vibration-reducing systems for cleanroom transit, and align every handoff with your production timeline.

Each project is designed with care, handled with discipline, and executed with technical precision—so fabs can resume production without delay. Because in this industry, timely installation means faster tape-out, earlier product launches, and accelerated delivery of the devices that shape our digital world.

With over five decades of experience supporting MNCs, SMEs, and global equipment makers, we've built more than crates—we've built trust.

Cleanroom Moving

Machine moving

Cleanroom Packing

Engineering Case

To further support the ecosystem, we're expanding our physical footprint in Singapore with a new 300,000 sqft Advanced Manufacturing Consolidation & Logistics Hub. This future-ready facility will feature temperature- and humidity-controlled environments for semiconductor equipment staging—both pre- and post-shipment. Backed by Heliconia Capital (an indirect wholly-owned subsidiary of Temasek Holdings), the hub is designed to maximise turnaround, minimise downtime, and optimise our customers' supply chains with just-in-time readiness.

But infrastructure is only part of the equation. That's why we partner with A*STAR, ITEs, and polytechnics to co-develop training modules and hands-on learning in specialised logistics. We believe the future of this industry depends not just on automation, but on nurturing people with deep technical understanding and practical expertise.

Regionally, we've also expanded into Johor to ensure seamless service continuity for cross-border equipment moves—strengthening Singapore's semiconductor connectivity within Southeast Asia.

Whether helping fabs reduce downtime or preparing the next generation of talent, our mission remains clear: to protect and position your business forward—safely, precisely, and on time.

www.sin-chew.com.sg

Sin Chew Woodpaq is a trusted provider of integrated packaging and logistics solutions for high-value industrial sectors ~ delivering end-to-end services from engineering design crates and high-purity protective packaging to contamination-controlled transport, storage, and material treatment.

SIN CHEW 星洲
Sin Chew Woodpaq Pte Ltd
Protecting & Positioning Businesses

BEYOND COMPLIANCE:

3 SMART MOVES TOWARD SUSTAINABLE WATER USE IN FABS

Water is essential to every stage of semiconductor manufacturing—from wafer cleaning to chemical dilution and rinsing. As fabs contend with increasing scrutiny over their environmental footprint, forward-thinking operators are re-evaluating how water is managed across the facility. Instead of a conventional compliance-driven approach, regulatory and infrastructure frameworks are nudging the industry toward more ambitious goals. In Singapore, for instance, fabs must demonstrate at least 50% water reclamation before they can request additional supply from PUB. To support this, PUB also offers to co-fund up to 50% of the capital expenditure for reclaim-related investments. These measures are accelerating the adoption of integrated sustainability strategies that strengthen long-term resilience, improve efficiency, and deliver better environmental outcomes.

This industry-wide pivot reflects broader ambitions to decarbonise operations, reduce pollutants, and regenerate natural resources—principles embedded in Veolia's strategic GreenUp program. Within this context, smart water management has become a powerful lever for ecological transformation.

Here are three practical moves fabs can make to improve water sustainability:

1. Design for Water Circularity, Not Just Treatment

Closing internal water loops reduces demand on freshwater sources and builds operational stability, particularly in regions facing water stress. Technologies like Electrodialysis Reversal (EDR) allow fabs to selectively remove salts and reuse high-purity water within the process. EDR offers high recovery rates, reliable performance despite feedwater variability, and minimal chemical use—making circularity a practical reality. In Singapore, a semiconductor fab partnered with Veolia to reclaim high-silica scrubber wastewater using an EDR-based solution. The system delivers over 70% recovery without relying on the heavy chemical dosing typical of ion exchange or RO—enabling stable reuse and advancing water circularity within the fab.

Electrodialysis Reversal (EDR) offers high recovery rates, reliable performance despite feedwater variability, and minimal chemical use-making circularity a practical reality.

2. Unlock Resource Recovery Opportunities Within Wastewater

Instead of discarding solvents like isopropyl alcohol (IPA) as mere waste, fabs can capture and recover them for use in other industries. Macro Porous Polymer Extraction (MPPE) enables selective removal of micropollutants without the use of chemicals—relying instead on steam regeneration, which can tap into heat already available within the fab. At a semiconductor fabrication plant in Taiwan, Veolia's MPPE system recovers over 100 cubic meters of water per hour. This water is redirected to cooling towers and raw water tanks, while recovered solvents are repurposed or resold—supporting more efficient resource use.

3. Scalable Waste Concentration that Enables ZLD Goals

As fabs work toward zero liquid discharge (ZLD), efficient wastewater concentration plays a critical role. Veolia's EVALED thermal evaporators offer a compact, modular solution that reduces waste volume and disposal needs while lowering energy use. Deployed at a semiconductor fab in Malaysia, the EVALED system handles 3 m^3/day of complex waste—delivering major savings in disposal and energy, while avoiding over 80 kg of CO_2 emissions per cubic meter. By minimising sludge and environmental impact, these systems support more sustainable and decarbonised operations.

While these moves each deliver clear environmental and operational benefits on their own, their impact is greater when adopted as part of an integrated water strategy. More than just a way to meet regulatory expectations, this approach would support broader goals of decarbonisation, depollution, and resource regeneration—building long-term resilience and efficiency into fab operations.

Evaporation technologies for wastewater treatment, water reuse and zero liquid discharge (ZLD), waste volume and disposal cost reduction, and by-products recovery.

Water is no longer just a utility—it's a strategic resource. As sustainability becomes a business imperative, fabs that adopt integrated water solutions are better equipped to navigate tightening regulations, maintain production stability, and stay competitive in a resource-constrained world.

Learn more about Veolia's sustainable solutions for the semiconductor industry at:

https://www.asia.veoliawatertechnologies.com/en/core-markets/electronics-and-photovoltaics

Email: ***mehbub.khan@veolia.com***

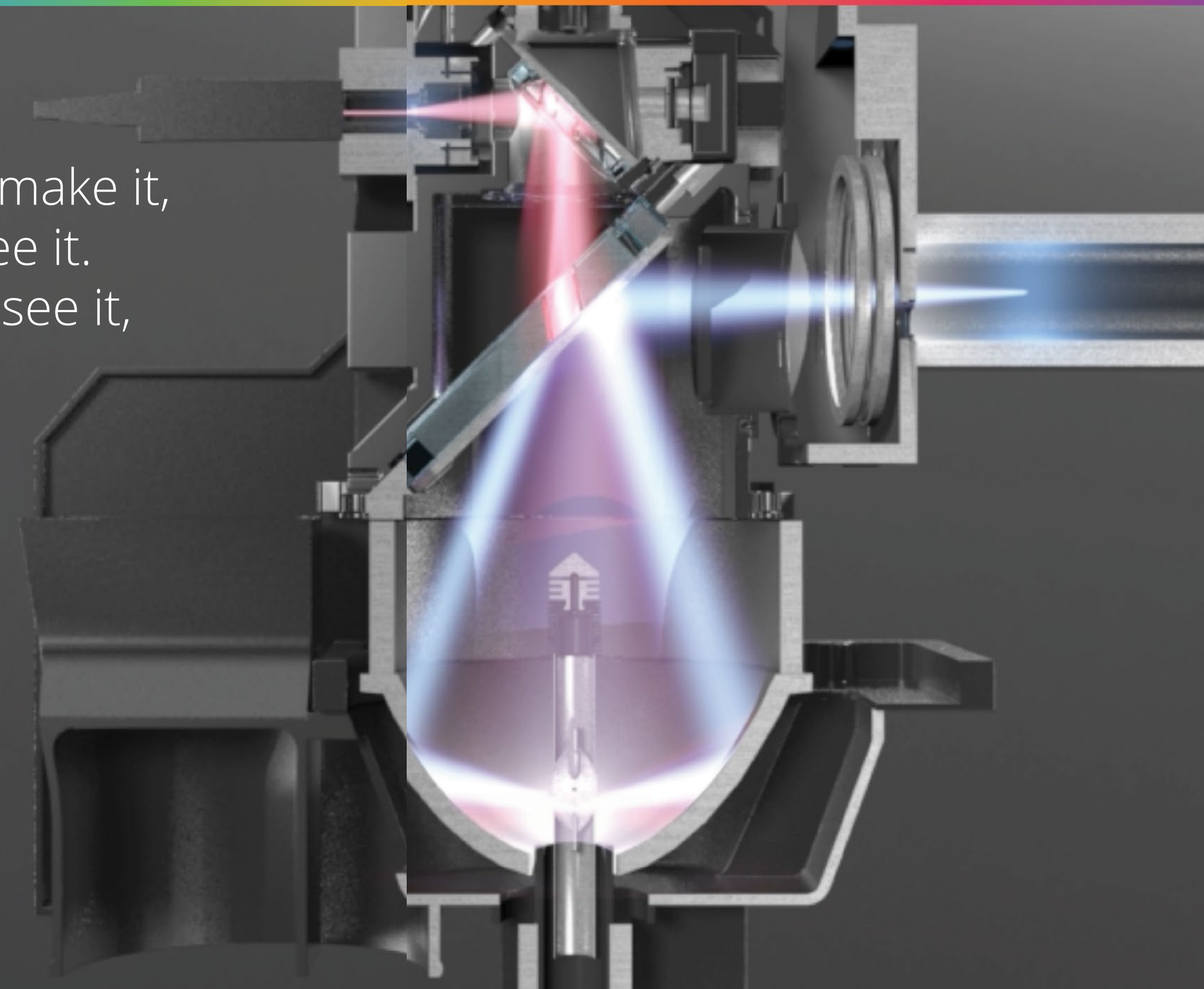
VEOLIA

By, **Mehbub Khan**,
Market Manager for Microelectronics, Asia Pacific,
Veolia Water Technologies

If you want to make it,
you need to see it.
If you need to see it,
see us.

KLA

Keep Looking Ahead



HELPING YOU NAVIGATE SUDDEN CHANGES IN THE MARKET

The semiconductor industry is famously cyclical in nature, often due to macroeconomic factors out of one's control. How does one decide when will be the right time to set up new facilities, or to acquire new machines in order to expand production capability? Will the newly acquired machines become white elephants in times of a sudden downturn?

At DISCO, we believe that what our customers really want is not just the product itself, but the processing results that are derived from using our products as a means. With this in mind, we provide our customers with the best processing results through our cumulated knowledge of Kiru (cutting), Kezuru (grinding) and Migaku (polishing) technologies.

DISCO is also acutely aware of all semiconductor players' processing requirements and concerns with regards to market changes. This is why DISCO offers our in-house dicing and grinding service as a means for our customers to cope with unexpected market trends. Our service, termed as "KKM Service", can be utilised for product development and small lot productions.

For new and difficult devices, it is important to ensure proof of mass production feasibility and quality before committing to any huge capital expenditure. DISCO is able to optimise the entire dicing and grinding process flow, which can be adopted full-scale once facilities are in place.

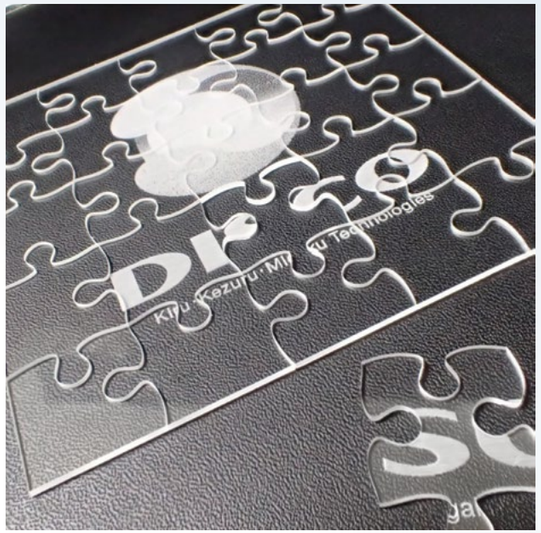
Another scenario would be if a new customer's order is received, but time is required for facilities and production capacity expansion. By engaging DISCO's KKM Service, a customer's order can still be fulfilled while expansion is underway.

Likewise, if you are a start-up company, DISCO can assist in achieving production stability, ensuring actualisation of economies of scale before the process is transferred for mass production.

Class 1K cleanroom (size: 276.8m2) at DISCO Hi-Tec Singapore

DISCO Hi-Tec Singapore's dedicated Class 1K cleanrooms are equipped with the latest DISCO machines and technologies. DISCO's global network also ensures that our KKM Service can be performed in a DISCO office that makes the most sense strategically and logistically.

Bicycle on a rice grain



LEAF2.0 glass puzzle

Please contact any DISCO office for more information on our KKM Service.

Contact us

https://www.disco.co.jp/eg/contact/general/contact.html

DISCO
Kiru · Kezuru · Migaku Technologies

https://www.disco.co.jp/eg/index.html

PRECISION ENGINEERING WITH ADVANCED CERAMICS & POLYMERS 3D PRINTING

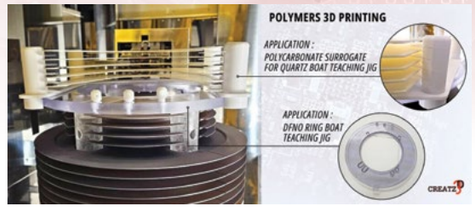
With over two decades of industry expertise, Creatz3D is a trusted partner in Singapore's additive manufacturing ecosystem, delivering industrial-grade 3D printing solutions that help businesses solve complex engineering challenges, streamline production, and stay ahead of disruption.

Our end-to-end 3D printing services range from design consultation to final part delivery, purpose-built to meet the specific demands of the semiconductor industry.

Ceramics 3D Printing Services for High-Performance Needs

We offer technical ceramic materials such as alumina, zirconia, aluminium nitride, silicon nitride and spinel – all known for their thermal stability, dielectric properties, and corrosion resistance. These properties are ideal for producing parts such as insulators, precision tooling, plasma resistant components and more, in demanding semiconductor processes.

By leveraging ceramics 3D printing services, you can eliminate long import lead times, reduce risk, enable complex geometries, and gain faster iteration cycle throughout your product development cycles.

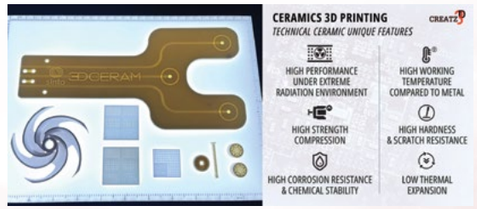


Polymer 3D Printing Services Supporting Cleanroom & ESD Applications

Polymer material properties such as ESD safety, high chemical resistance and flexibility support a wide range of applications from jigs and fixtures to fluid-handling components in cleanroom environments. Using materials like PEKK, ULTEM™, Polycarbonate and others, we offer solutions that support both rapid prototyping to end-use production, thereby alleviating the constraints associated with traditional tooling.

Localized Agility with Additive Manufacturing

We support both multinational corporations (MNCs) and local SMEs to turn critical challenges into tangible functional solutions. Whether it's scaling up from a prototype or tackling a recurring production challenge, our in-house infrastructure and consultative approach to additive manufacturing allow us to deliver results that align with industry standards and future-forward goals.



CREATZ3D

www.creatz3d.com.sg *Creatz3D Pte Ltd*

HOYA X SSIA SME PARTNERSHIP FEATURE

Our collaboration with local SMEs is more than just a procurement strategy, it is a long-term commitment to building a resilient, adaptive, and trustworthy global supply chain. Localization and close partnerships with SMEs not only reduce risk and enhance responsiveness, but also nurture innovation within local ecosystems. These partnerships empower regional businesses to grow, adapt, and deliver unique, agile solutions grounded in a deep understanding of local needs and operational challenges.

At HOYA Electronics Singapore, our journey began since the startup in 2012 with strong reliance on Japanese vendors due to technology transfers from our parent plant in Japan. However, we quickly recognized that global sourcing carries inherent risks, ranging from natural disasters such as earthquakes and tsunamis to shipping delays caused by port congestion. To mitigate these risks, HOYA Electronics Singapore proactively pursued supplier localization as a strategic priority.

Over the years, we've partnered with local vendors to support key services such as parts fabrication, parts cleaning, failure analysis, plant maintenance, tools repair and refurbishment. These collaborations have not only enhanced operational continuity but have also fostered joint innovation.

Examples of Customized Manufacturing Solutions partnering with local SMEs:

1. Autonomous Intelligent Vehicle System (EUV Blanks production line startup in 2018)

In lieu of replicating traditional rail-guided vehicles from Japan, we partnered with local vendors to design a flexible, autonomous vehicle solution. This forward-looking initiative now supports multiple systems within our operations, enhancing both efficiency and adaptability.

2. Automated SMART Label Verification Machine

Before: Multiple manual data entry and visual check operations led to quality escapes, 2 cases in 2022 and 7 in 2024, resulting in customer complaints.

Solution: A local SME developed a cost-effective, responsive automation solution using cameras and barcode to capture requirement information to inspect labels and confirm packing weights.

Results: This eliminated human error, streamlined multiple manual processes into one station, and opened pathways for further RPA (Robotic Process Automation) integration.

As we look ahead, HOYA Electronics Singapore remains steadfast in engaging local SMEs for future value-added collaborations. We invite our partners and peers to join us in investing in these vibrant ecosystems, not only to strengthen our supply chain, but to co-create sustainable innovation and earn enduring customer trust.

Local Supplier Development Cycle

HOYA

By: **Alvin Lim**
Division Senior Director, Procurement

BUILDING RESILIENCE THROUGH INTEGRATION:

STRENGTHENING MISSION-CRITICAL INFRASTRUCTURE IN SINGAPORE

Singapore has been accelerating efforts to enhance its local semiconductor ecosystem, emphasising the importance of resilient, mission-critical infrastructure. At OneSystems Technologies (OST), we believe true resilience doesn't begin when a system goes live—it starts with deep understanding of operational challenges and a commitment to solving them with precision and purpose.

OST Celebrates Its 20th Anniversary at Goodwood Park Hotel

Before founding OST, I encountered a client who was overwhelmed by the complexity of transitioning from analogue to digital systems. They were dealing with redundant wiring across multiple systems, which not only delayed implementation but also made support and maintenance inefficient. This experience revealed a critical gap—the need for integrated, end-to-end solutions that could streamline operations, reduce risk, and eliminate system fragmentation.

OST began as a small tech company with a vision—to solve real business problems through custom-engineered systems that boost productivity, enhance operational security, and reduce costs. Over the past two decades, we have grown into a trusted Operational Technology (OT) and Information Technology (IT) systems integrator, supporting international clients across the semiconductor and technology sectors.

Today, OST specialises in mission-critical infrastructure, where even a minor failure can result in significant operational and financial risk. As a BCA-registered ME04 L6 vendor, we design and implement fully integrated systems across both OT and IT domains, from Safety and Security Systems, Facilities Management Systems, to Process and Control Automation Systems—ensuring seamless performance, reliability, and end-to-end visibility across complex environments.

OST project team group photo at Micron FAB 10A site

We just celebrated our 20th anniversary this year and we are excited for what lies ahead. We are extending our integrated OT and IT services into the pharmaceutical and data centre sectors, while deepening our presence across the Asia Pacific region.

As our business grows, so does our commitment to our values. This next chapter will be guided by our renewed core principles of Ownership, Sustainability, and Trustworthy, ensuring we continue to deliver with accountability, long-term impact, and unwavering reliability for every client and partner we serve.

ONESYSTEMS
TECHNOLOGIES PTE LTD

By, **Eunice Hong**, CEO,
OneSystems Technologies

SUSTAINABILITY IN SEMICONDUCTORS:

A COMMITMENT STILL IN TRANSITION

The semiconductor industry has made bold public commitments toward achieving net-zero emissions, but the reality on the ground often tells a different story. While the intent is clear, the execution remains inconsistent—especially at the operational level.

One of the most pressing challenges is **budget, resource, and space constraints**. Many older semiconductor sites operate on tight maintenance budgets, with little room—financially or physically—for new sustainability initiatives. Space limitations in legacy facilities often make it difficult to retrofit or install modern environmental monitoring systems. In today's volatile business climate—marked by market slowdowns and workforce reductions—sustainability often takes a back seat. The limited manpower available is typically focused on keeping the plant running, leaving little bandwidth for proactive environmental efforts.

Regulatory and internal policy enforcement also plays a significant role. In Singapore, local agencies have set a strong example with rigorous monitoring of trade effluent discharge quality and quantity. However, in many cases, sustainability actions only gain traction when local regulations tighten. For multinational corporations, internal sustainability policies may exist, but without strong enforcement mechanisms, they often remain aspirational rather than actionable.

Another overlooked area is **instrumentation and measurement**. Accurate environmental monitoring depends on reliable data—but many plants struggle with improperly installed or poorly maintained meters. The operational complexity of semiconductor facilities often places a heavy burden on utilities engineers, who are expected to manage and maintain hundreds of instruments—each with different technologies, functions, and calibration requirements—while ensuring uninterrupted plant performance.

At **Endress+Hauser**, we recognize the unique challenges faced in the semiconductor industry. Our broad portfolio of **flow, liquid, and gas analyzers**, combined with **Heartbeat Technology** and **IIoT-enabled solutions**, helps semiconductor plants monitor critical parameters with confidence. Through our strategic partnership with **SICK**, we also offer comprehensive **gas monitoring** for emissions and hall environments. To address skilled manpower shortages, our **dedicated service teams** provide on-site support, calibration, commissioning, and training—ensuring that even resource-constrained plants can maintain high standards of measurement accuracy and compliance.

Endress+Hauser
People for Process Automation

PLP-Panel Handling Robot

AR-WG400CL-4-T-HH350

Supports Large Panels

Supports panels up to 600×600 mm, with a payload of 8 kg
(panel: 5 kg, hand: 3 kg)

Reinforced Lift and Extension Axis

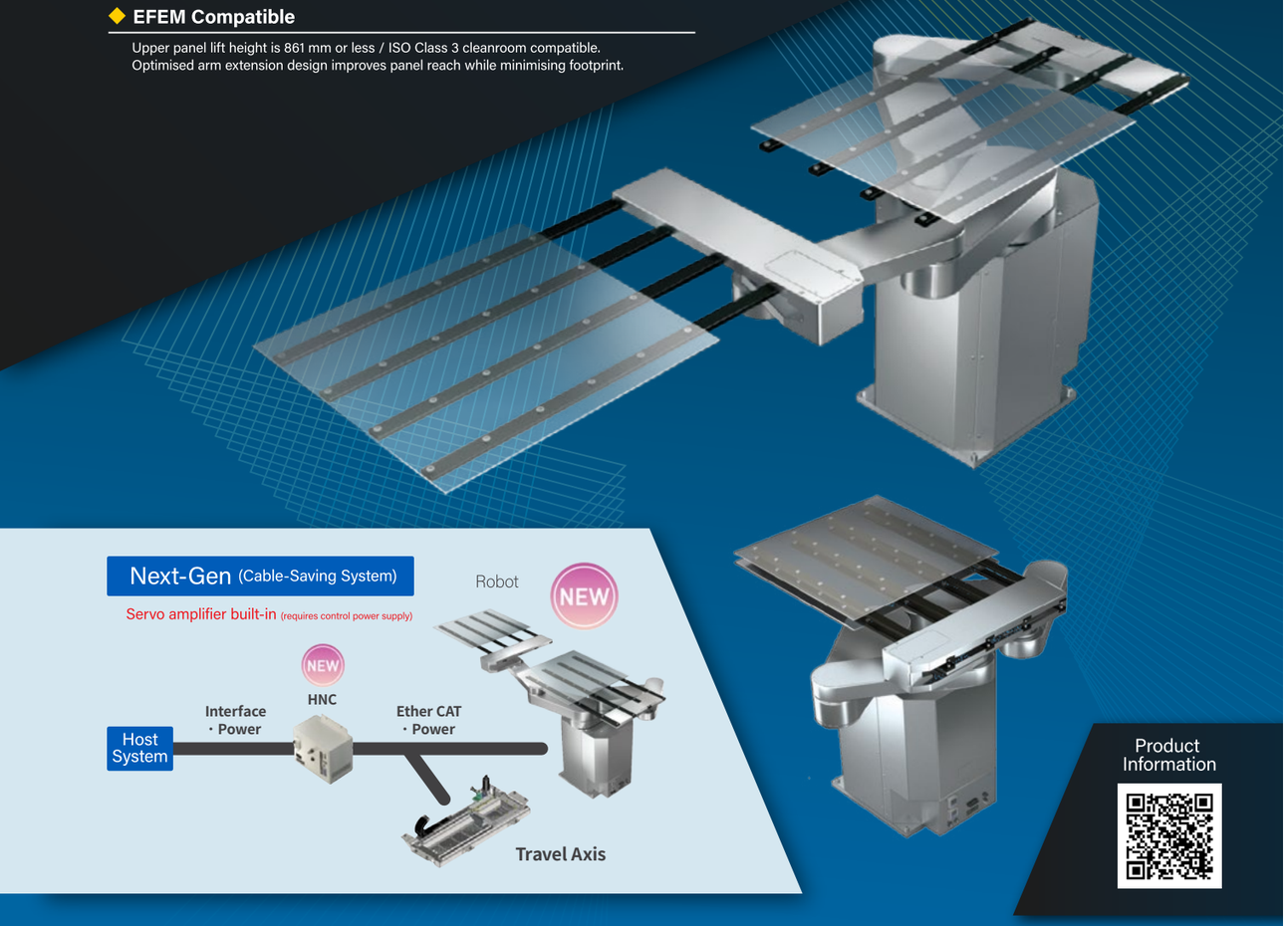
2.5 times higher rigidity compared to previous models reduces vibration during panel handling.

Built-in Servo Amplifier

Servo amplifier built into the robot body to save space.
Simplified wiring to the controller enables a more compact cable system.

EFEM Compatible

Upper panel lift height is 861 mm or less / ISO Class 3 cleanroom compatible.
Optimised arm extension design improves panel reach while minimising footprint.



Product Information

The Global Production Engineering Company **Hirata**

AI SOLUTIONS FOR SEMICONDUCTOR AND COMPLEX MANUFACTURING

INNOWAVETECH®

Innowave Tech is a Singapore-based technology leader in AI-powered manufacturing products and solutions, serving 30+ Leading Semiconductor and Equipment makers across the US, EU, Japan, China, and SEA. We specialize in developing and deploying industry-specific solutions to optimize and simplify semiconductor and advanced manufacturing globally.

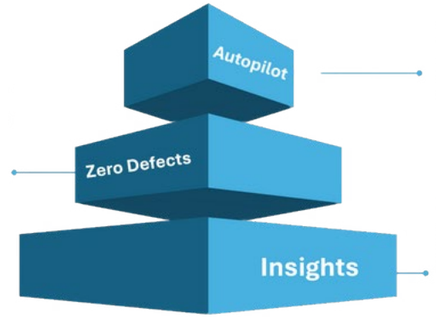
Our platform turns factory data into decisions – Our products enable **Autonomous Operations, AI Defect Detection, Predictive Health Monitoring, and Real-Time Optimization.**

We make **Manufacturing Simplified.**

Tackle dynamic workflows, defect data scarcity, and streamline data collection with end-to-end domain-specific solutions.

iWave ZeroDefects

Advanced vision agent achieve <0.1% escape with <1% overkill without reliance on defect data



iWave Autopilot

Fully autonomize manufacturing equipment - operation, monitoring, intervention, tuning and configuration

iWave Insights

Cognitive AI for Performance Optimization, Predictive Health, Knowledge Lake Integration, and Smart Troubleshooting

We deliver Domain-Specific Agentic AI for the Industry's Most Complex Challenges

Gaps toward Factory Intelligence

- Non-standardizable operation
- High cost & low efficiency
- Accuracy depends on human judgement and Skills
- Lack of real time prediction & optimization (data driven)

End-to-end industry-focused and proven solutions

- Non-intrusive data acquisition
- Data-driven decision and operation
- Real-time orchestration and execution

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PRECISION AT ITS BEST

www.nutek-sg.com

ENGINEERING AUTONOMY FOR TOMORROW'S FABS

*Q&A with **Mazher Najeeb Anwar**,*
Chief Technology Officer, SESTO Robotics

Prime 2

What is the SESTO Prime 2, and how does it address the specific needs of the semiconductor industry?

The SESTO Prime 2 is an advanced autonomous mobile robot (AMR) engineered specifically for high-precision material handling in cleanrooms and controlled environments. Designed with the stringent requirements of the semiconductor industry in mind, Prime 2 addresses key operational challenges such as contamination control, electrostatic discharge (ESD) mitigation, and accurate point-to-point transport.

Fully compliant with Class 100 cleanroom standards, Prime 2 features an anti-static chassis and low-emission electronics to safely transport sensitive carriers such as FOUPs, wafer cassettes, SMIF pods, or other substrate handling units. Every aspect—from its compact, manoeuvrable form factor to its intelligent software stack—has been optimized for seamless deployment in semiconductor fabs.

Safety is paramount in cleanroom environments. How does Prime 2 ensure operational and personnel safety during autonomous transfers?

Safety is a core focus. Prime 2 is equipped with high-resolution LiDAR, 3D depth cameras, and ultrasonic sensors to detect obstacles and human movement. It complies with CE and SEMI S2 safety standards and includes redundant emergency stops and controlled motion profiles to avoid abrupt or unsafe actions. For accuracy, the robot verifies its location and payload using RFID or barcode scanning before executing any task - ensuring operational accuracy and material traceability.

How is SESTO future-proofing Prime 2 for smart manufacturing?

We're investing in AI and Industry 4.0 technologies to make Prime 2 smarter and more adaptive. Our roadmap includes machine learning-based navigation, predictive maintenance via digital twins, and real-time analytics. Upcoming features include AI object recognition and intelligent grasping, reducing the need for manual teaching or fixtures. These innovations are designed to support lights-out manufacturing and enhance productivity with minimal human intervention.

SESTO™

Sesto Robotics Pte Ltd

www.sestorobotics.com
+65 6266 1522

INFICON

Smart Manufacturing

Unlock the Future of Autonomous Manufacturing with AI-Driven Smart Solutions

Enhance your factory's competitiveness by leveraging AI and machine learning. Gain unparalleled real-time data insights and automate decision-making to optimize your operations. Achieve operational excellence with Digital Twins, offering comprehensive data visibility, reduced cycle times, and optimized resource allocation.

- Transparent operations with complete data visibility
- Smart Sensors offer detailed process insights
- Real-time analytics enable confident decisions
- Higher profits through faster cycles and optimized resources
- Sustainable data governance with a single truth source
- User-friendly interface for all management levels

Elevate your factory to new heights with INFICON.

Discover more at ims.inficon.com

FabGuard®
FabGuard FDC System provides unparalleled capability to connect, collect, and translate data into meaningful information. Engineers use this information to develop deep insights into tool capability and process optimization. In addition to working alongside proven FDC techniques, powerful unsupervised Machine Learning with SmartFDC® enables FabGuard to automatically detect when changes occur.

FPS and FabTime®
FPS Digital Twin is the most critical building block for developing a Smart factory. It collects all the real-time operations events to compute cycle time and throughput data to drive powerful applications. FabTime's flexible reporting has been instrumental in empowering fabs with clear and immediate visibility into factory performance, leading to marked improvements in cycle time, capacity, productivity, and profitability.

Smart Sensors
INFICON Smart Sensors accurately measure real-time process conditions including, trace gas concentrations, impurities, and process byproducts. INFICON empowers manufacturers to control processes with greater precision, leading to higher yield, better process control and reduced defects.

EMPOWERING SMARTER FABS:

A SINGAPORE SME'S TAKE ON GLOBAL MACHINE MONITORING INNOVATION

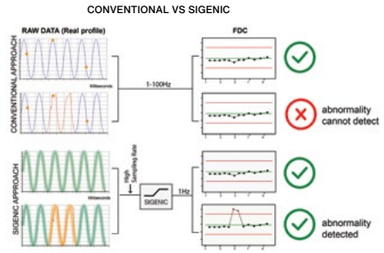
Singapore's semiconductor ecosystem is rapidly evolving — and local SMEs like Sigenic are at the forefront of this transformation. Specializing in real-time machine condition monitoring, Sigenic has developed a proprietary edge-based software platform that is changing how fabs manage machine stability, reliability, and sustainability — all in a more cost-effective manner.

Traditional approaches to machine performance monitoring often suffer from blind spots. Many simply increase the number of detection points or raise data sampling rates without a scientific understanding of how to manage and interpret such massive data volumes. This leads to soaring costs, overloaded networks, and latency issues that disrupt production flows. Sigenic takes a different path. Its self-developed software, SEREBRO, performs high-resolution, multi-dimensional data analysis directly at the edge — near machine sensors — delivering accurate, real-time insights without overburdening factory systems. The result? Improved reliability, reduced wafer scrap, and significant cost savings.

It effectively achieves:

- Prevents excursions by prediction
- Minimizes wafer scraps and improves production reliability
- Real-time monitoring of machine behaviour down to sub-millisecond level
- Unleashes the full potential of existing factory host analytical performance
- Cost-savings by avoiding expensive server upgrades

More than just a technical breakthrough, Sigenic's solution strengthens Singapore's position as a hub for semiconductor innovation. By enabling manufacturers to gain better control over their production environment, the company directly supports efforts to build more sustainable and resilient fab operations. The system has already been successfully integrated into global fabs alongside platforms like E3, Bistel, Thingworx, Camline Space and etc, proving its effectiveness across various manufacturing environments.

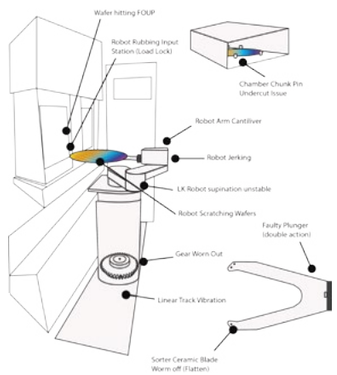


With Sigenic's methodology, the system is able to capture acute and isolated abnormalities without increasing the host's sampling rate.

Importantly, Sigenic's success is deeply tied to Singapore's innovation-friendly environment. As a homegrown SME, Sigenic benefits from proximity to research institutions, semiconductor MNCs, and government agencies that foster collaboration. This local ecosystem enables rapid innovation, testing, and deployment — helping Sigenic evolve from a technical contributor into a strategic global partner.

Sigenic's journey highlights how Singapore SMEs can contribute meaningfully to improving fab efficiency and sustainability, using locally developed innovations to support the global semiconductor industry.

Examples of a use case:



Application:
- Wafer Handling Robot Monitoring

Predictive Measure
- Advanced modeling of robot behavior to prevent issues through prediction. As illustrated, one system can handle all critical spots of the robot's movement.

Gain:
- Uptime gain up to 0.5% per tool
- One-off gain up to USD1.4M with product gain up to USD540K/month
- Eliminate multi-million loss from excursion (based on recent cases)

SIGENIC

STRENGTHENING LOCAL ECOSYSTEM

CSR activities – Tokyo Electron Singapore

1. Earth Day 2025 – Tree Planting

This Earth Day, Tokyo Electron Singapore took the initiative and dedicated this very important day by planting a total of 8 trees at Mckenzie Road as part of the Plant-A-Tree programme under Garden City Fund and to provide our contribution towards the #OneMillionTreesSG movement in planting a million trees across Singapore over a span of 10 years.

Planting trees is extremely beneficial in combating climate change, improving quality of air in the environment as it serves a natural air filter to provide clean air, and supports biodiversity of plants, animals, fungi, and other microorganisms. Each sapling is a step towards a greener future.

2. Down Syndrome Association (DSA)

During the March school holidays, Tokyo Electron Singapore sponsored and brought a group of down syndrome beneficiaries from Down Syndrome Association (DSA) and their caregivers to Asian Civilization Museum for a create your own personalized porcelain workshop and a museum tour experience.

Beneficiaries and caregivers were each given an option to choose between a porcelain plate or cup, to design and personalized their pieces using unique local decal stickers provided. Volunteers paired up with the beneficiaries to provide any assistance they may need and took care of them throughout the session. It was a delightful afternoon well spent and everyone's art pieces were beautifully designed!

3. Beyond Social Services (BSS)

Tokyo Electron Singapore sponsored school supplies and snack goodie bags to children from lower-income communities. Volunteers delivered these goodie bags personally to each student and had a meaningful experience connecting with them.

The goodie bag contains some essential school supplies such as notebook, correction tape, staplers, various pens, pencil, highlighter, etc. which will be useful for their new school term!

4. Port63 Challenge (NTU)

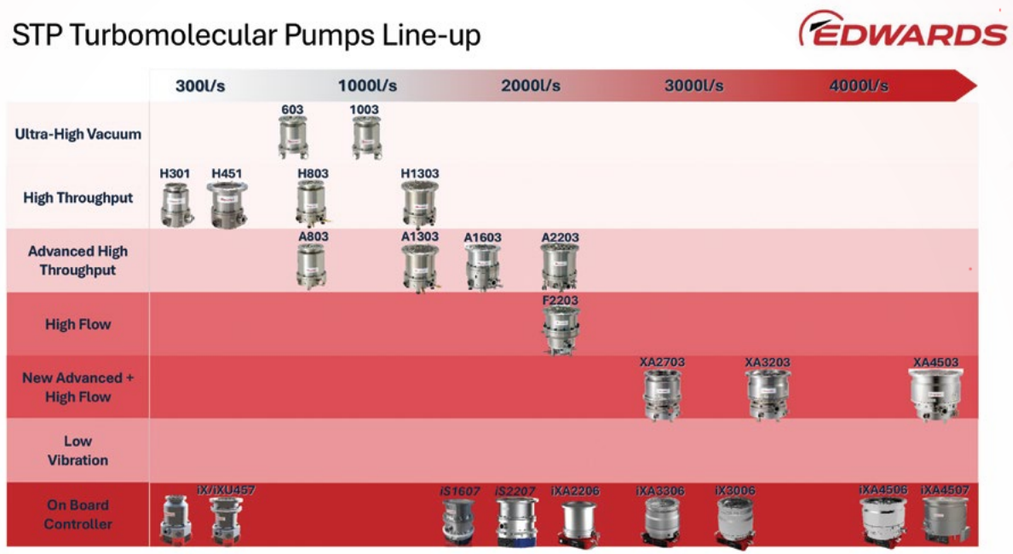
Tokyo Electron Singapore was proud to be a prize sponsor for NTU's Port 63 event, a Hackathon that served as an exciting platform for innovation and entrepreneurship. The event attracted 45 teams, comprising approximately 120 participants, all eager to showcase their groundbreaking ideas.

The final pitch took place on 14th March 2025, where finalists presented their projects in front of esteemed judges. Tokyo Electron Singapore not only played a crucial role as a judge but also actively participated in the award ceremony to celebrate the achievements of the participants. This partnership underscored our commitment to fostering innovation and supporting the next generation of leaders in technology and business.

We look forward to continuing our collaboration with young talents and academics.

EDWARDS STP TURBOMOLECULAR PUMP LINEUP:

COMPACT AND HIGH-PERFORMANCE SOLUTIONS



Edwards offers a diverse range of **STP turbomolecular pumps (TMPs)** designed for ultra-high vacuum (UHV) applications across industries like semiconductor manufacturing, LCD production, and coating processes. Here's a snapshot of key models and their uses:

1. H & A Series (High Throughput)
- **Models:** STP-H301, STP-A2203, etc.
- **Applications:** Dry etching, CVD, sputtering, and ion implantation.
- **Features:** Compound rotor design for efficient gas handling in demanding environments.

2. F Series (High Flow)
- **Model:** STP-F2203.
- **Applications:** Processes requiring high gas throughput, such as advanced semiconductor fabrication.

3. XA Series (Advanced High Throughput)
- **Models:** STP-XA2703, STP-XA4503.
- **Applications:** Combines high pumping speed with corrosion resistance for harsh conditions.

Integrated Controller Pumps (Space-Saving)
- **iX/iXU Series:** Low-vibration, magnetically levitated pumps (e.g., STP-iX457) ideal for sensitive UHV systems.
- **iS Series:** Compact and energy-efficient (e.g., STP-IS2207) for coating and light-duty applications.
- **iXA Series:** Fully integrated onboard control (e.g., STP-IXA4506) reduces footprint and simplifies installation.

Why Choose Edwards STP Pumps?
- **Compact designs** save space and lower cost of ownership.
- **IP54-rated models** (e.g., iXA Series) resist dust and moisture.
- **Digital control** ensures stability in high-vibration environments.

For high-performance vacuum solutions, Edwards' STP lineup delivers reliability across critical industrial applications.

EDWARDS

DBS Live more, Bank less

Power your decarbonisation & transition plans

Live *sustainably*

with the World's Best, Asia's Safest.
Add our strength to yours

DBS Corporate Banking

Safest Bank in Asia, 2009 - 2024
Global Finance

Best ESG Transaction Bank, Asia Pacific, 2025
Global Finance

Best Bank for Sustainable Finance, Global & Asia Pacific, 2025
Global Finance

SME CENTRE@SMF

SME Centre@SMF, established in 2025 with support from Enterprise Singapore, provides complimentary, customised business advisory services to help SMEs like yours.

We understand that every business is unique, which is why our experienced Business Advisors work closely with you to create practical and tailored solutions. We cover a wide range of topics including digitalisation and automation to branding, productivity, and overseas expansion.

SMEs are the backbone of Singapore's economy, and we are here to support your next leap forward. You may connect and set up an appointment with a Business Advisor who can be your partner for business growth!

Looking ahead, we invite business owners and leaders to join us at the **SME Centre Conference 2025** — a must-attend event for forward-thinking enterprises. This year's theme, **'Driving Business Transformation & Growth through Partnerships'**, will feature:

- Key Topics: Innovation, Strategic Alliances, Business Growth, AI Agent and Automation, Tariff Strategies, Johor-Singapore SEZ, and Digital Transformation
- Featured Speakers: Industry leaders and SME transformation experts
- Interactive Sessions: Fireside chat, panel discussions, networking opportunities

Scan to Book Your Complimentary 1-to-1 Business Advisory Session:
https://partnersengage.enterprisesg.gov.sg/book-appointment?centre=smec_smf

Find Out More About the Conference:
https://www.smecconference.sg/

Scan to Register Now:
https://www.gevme.com/smecc2025

POWERING INNOVATION. BUILDING A GREENER FUTURE.

Partner with Ngee Ann Polytechnic to future-proof your business

At Ngee Ann Polytechnic (NP), we don't just prepare learners for what's next – we help shape it. With support from Enterprise Singapore (EnterpriseSG), our three Centres of Innovation (COIs) help businesses turn ideas into real-world impact:

- Centre for Environmental Sustainability (CfES)
- Centre of Innovation for Built Environment – Robotics & Automation (COI-BERA)
- Advanced Manufacturing Centre of Innovation (AMCOI)

These COIs enable SMEs to co-develop, prototype, and test solutions across green technologies, smart building automation, and industrial transformation. EnterpriseSG supports this ecosystem through funding, strategic guidance, shared facilities, and expert-led training, all designed to help businesses stay competitive.

Through these platforms, SMEs can tap into:

- Expert consultation
- Prototyping and test-bedding facilities
- EnterpriseSG funding support
- Tailored capability-building programmes

NP's innovation efforts are further strengthened by its Robotics Research & Innovation Centre and a network of Technology Clusters focused on:

- Advanced Manufacturing & Automation
- Autonomous Vehicles
- Digital Connectivity
- Green & Sustainable Technology
- Health & Medical Technology
- Marine/Underwater/Unmanned Aerial Vehicles
- Service Robots

To complement these applied R&D capabilities, NP offers a range of sustainability-focused professional courses:

- **Carbon Management for SMEs**
Learn to manage Scope 1–3 emissions, understand the Carbon Pricing Act, and explore decarbonisation strategies.

- **Zero Waste Essentials: Strategies for Sustainable Operations for Business**
Implement waste reduction strategies and comply with NEA reporting standards.

- **Sustainability Reporting Essentials for SMEs**
Transition from Corporate Social Responsibility (CSR) to Environmental, Social, and Governance (ESG) reporting with clarity on frameworks, metrics, and regulatory compliance. Develop a sustainability reporting action plan tailored to SMEs.

- **Sustainable Futures: Navigating Risks, Social Impact and Sustainable Financing for SMEs**
Transition from CSR to ESG reporting with clarity on frameworks and compliance.

- **Develop a Climate Change Transition Plan using Greenhouse gas (GHG) Accounting and Life Cycle Assessment (LCA) Methodology**
Establish and report GHG inventories using ISO 14064 and apply Life Cycle Assessment (LCA) methodologies.

Together, NP's innovation ecosystem and targeted training programmes provide a robust foundation for accelerating sustainability, enhancing resilience, and driving enterprise transformation.

Explore collaboration opportunities:

✉ partnerships@np.edu.sg
🌐 www.np.edu.sg/industry
🌐 www.cet.np.edu.sg

ngee ann polytechnic

A NEW BLUEPRINT:

BUILDING AI-READY ENGINEERS WITH CAIPENGG

As the semiconductor industry develops rapidly, companies must remain competitive in their production capabilities while maintaining their talent attraction and retention. To balance this critical part of the equation, developing interdisciplinary talent – to build AI skillsets in engineers – is increasingly crucial for both engineers and organisations.

When domain experts gain the latest AI competency, they save time on the most menial tasks and maximise AI to reach their fullest potential. For companies, this fusion of expertise can turn complex technical challenges into smart, data-driven innovations. According to McKinsey Insights, the expansion of Generative AI could contribute an additional $300 billion to the industry, resulting in a total revenue of $1.3 trillion by 2030.

Acknowledging the growing importance of AI skillsets in engineering, the Singapore Semiconductor Industry Association, AI Singapore, and Nanyang Polytechnic have announced a strategic partnership for the **Certified AI Practitioner – Engineering (CAIPEngg) framework** on 10 July 2025.

This framework will formally recognise the competencies of engineering professionals in AI-related roles with a joint certificate issued by AI Singapore and Nanyang Polytechnic, establishing a standard for AI proficiency within the engineering field.

CAIPEngg focuses on four key AI competencies to provide engineering professionals with up-to-date AI knowledge and practical skills. These competencies are applicable to a range of engineering domains within the semiconductor industry, such as automating process control, improving production yield, and reducing defect rates in intricate processes like photolithography, etching, doping, and deposition.

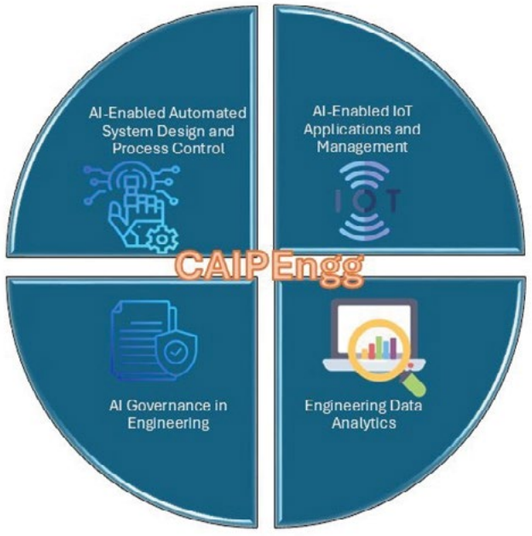


Figure 1: The four AI competencies of the CAIPEngg Framework

Referencing Nanyang Polytechnic's Professional Competency Model, the CAIPEngg framework enables engineering learners and professionals to **proficiently adapt to the latest AI technology and apply AI skills effectively**. By leveraging **system thinking** and **just-in-time learning**, learners are equipped with the necessary skills to delve deeply when required and utilise AI as a powerful "black box" tool to achieve their objectives.

All full-time engineering students at Nanyang Polytechnic will learn about the competencies outlined in the **CAIPEngg framework** throughout their years of studies, with the first cohort fully trained on this framework in 2027. This ensures that students can effectively apply their skills during internships, allowing employers to directly observe and experience the advantages of the framework.

Engineers interested to upskill can also attend Nanyang Polytechnic's **"Building Artificial Intelligence (AI) Applications from End to End" course**, which aligns directly with the four core competencies of the CAIPEngg framework. Besides understanding how AI tools fit into the broader engineering workflow and solve challenges, learners will apply what they have learnt to solve actual engineering challenges in a one-month project – supported by expert trainers through consultations and personalised feedback.

What's more game-changing: Businesses may also leverage this SkillsFuture-subsidised course for corporate training purposes, allowing engineering teams to collaboratively devise solutions tailored to their projects at the organisational level.

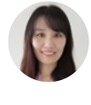
As AI continues to influence the engineering landscape, the CAIPEngg framework offers engineering professionals and students distinctive opportunities to future-proof their careers. Be it enhancing career capabilities, pivoting into AI-driven domains, or contributing to smarter and sustainable solutions, CAIPEngg provides the recognition, skills, and confidence for individuals to remain in demand across industries – and to do more and beyond.

Contact Nanyang Polytechnic to find out more about the CAIPEngg framework/certification and AI training courses.

Explore and sign up for AI courses with Nanyang Polytechnic-Microsoft Centre for Applied AI. Business entities can apply for grant support when participating in selected programmes.

NANYANG THE INNOVATIVE POLYTECHNIC

www.nyp.edu.sg



Dr Sophia Wei
Asst. Director (Continuing Education and Training & Industry Development)
School of Engineering, Nanyang Polytechnic

WSG REBRANDS ELECTRONICS CCP TO ALIGN WITH INDUSTRY 4.0

WSG's Career Conversion Programme (CCP) for the electronics sector has been renamed to **"CCP for Advanced Manufacturing Engineer and Assistant Engineer (Semiconductor and Electronics)"**, reflecting the sector's transformation towards Industry 4.0 and emerging job roles in smart manufacturing.

Since its launch in 2016, the CCP has successfully reskilled over 2,500 mid-career individuals into new or redesigned job roles. The programme enables companies to look beyond traditional "plug-and-play" hiring by tapping into a wider talent pool of experienced professionals from other sectors. Through structured on-the-job training, companies can effectively convert these mid-career individuals into emerging roles such as AI Engineers, IoT Specialists, and Smart Manufacturing Engineers.

As Singapore's semiconductor ecosystem continues to attract significant investments and expand its advanced manufacturing capabilities, the CCP serves as a vital tool for companies facing talent shortages in emerging roles. The programme offers up to 90% salary support during the training period through two tracks:

- Place-and-Train: For companies hiring and reskilling mid-career individuals

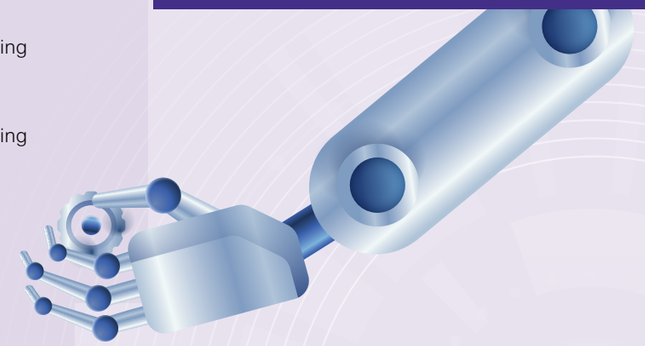
- Job Redesign Reskilling: For companies reskilling existing employees for enhanced or redesigned job roles

For more information, contact SSIA at ***secretariat@ssia.org.sg***

Looking to expand your advanced manufacturing capabilities beyond Singapore? WSG's Overseas Markets Immersion Programme (OMIP) complements your talent development strategy by supporting overseas exposure for your workforce.

Develop your talent pipeline locally through CCP and globally through OMIP.

Contact SBF at ***omip@sbf.org.sg*** to learn more.



Workforce Singapore

Empower Your Workforce for Global Success

Overseas Markets Immersion Programme (OMIP)

Support companies to groom their local workforce for global or regional roles through overseas postings and on-the-job training to gain relevant in-market experience.

How does this work?

Companies with market expansion or business transformation plans → Singapore Citizens / Permanent Residents without relevant overseas experience in the identified market → Work with appointed programme partner to send selected employees for overseas on-the-job training to develop global ready talents

How can this benefit the company?

Up to 9 months:
Up to **70%**

salary support (capped at $5,000/month) + overseas allowance (capped at $3,000/month) + **Reskilled global ready talents!**

Company eligibility

- Registered or incorporated in Singapore
- Offer employees a fixed monthly salary of at least $4,000
- Provide market expansion and/or business transformation plans
- Develop a training plan and a career development plan for participating employees

Ready to go global?

Contact our programme partner, SBF, to expand your business horizons.

Singapore Business Federation (SBF)

6827 6828

ccp@sbf.org.sg

For more information, visit **go.gov.sg/omip-info** or **scan the QR code.**

Programme Partner:

SBF

SEMICONDUCTOR TRADEWINDS JUNE 2025

As we approach the midpoint of 2025, the semiconductor sector continues to exhibit a consistent upward growth trajectory. The growth is primarily attributed to the surge in Artificial Intelligence (AI) adoption and helped by an increase in last-minute rush pre-orders placed ahead of the U.S. reciprocal tariff exemption deadline. For the first 5 months of 2025, TSMC's revenue has grown 43% year on year to US$50billion. TSMC continues to outgrow the foundry market, benefiting from its advanced technology, which supports both AI and high-end smartphone markets. Conversely, other segments, such as automotive and industrial, have experienced slower growth, which causes other foundries and OSATs to have much lower single digit year on year growth so far.

For the full year the latest analyst forecasts for the global electronic market are predicting the market to grow approximately 10% this year (+/- 2%) to around US$700billion. The uncertainty is due to the geopolitical tensions and how severe tariffs will be.

In April, the U.S. administration announced a temporary postponement of the previously announced substantial reciprocal tariffs on 60 countries with the implementation of tariffs postponed until July 8th, with the exception of China. This decision was intended to provide time for these countries to engage in trade negotiations whilst the baseline 10% tariff remain in place. In May and June, China and the U.S. engaged in separate trade talks, resulting in an agreement to reduce the tariffs on Chinese goods entering the U.S. to 55% and for U.S. goods entering China to 10%. Additionally, it was announced that other electronic goods, such as smartphones, in addition to semiconductors would be exempt from the tariffs. At the time, it was mentioned that separate tariffs would be imposed on semiconductor and electronic goods shortly, and the Commerce department initiated an investigation to determine the effects on national security of this sector. However, as of now, there has been no further news on this matter.

Even though there was a pause on tariffs, the United States Department of Commerce did impose additional new technology restrictions on China in May. It directed semiconductor software design companies, such as Cadence and Synopys, to cease selling to China without an export license, which will be granted on a case-by-case basis.

Singapore Semiconductor Update

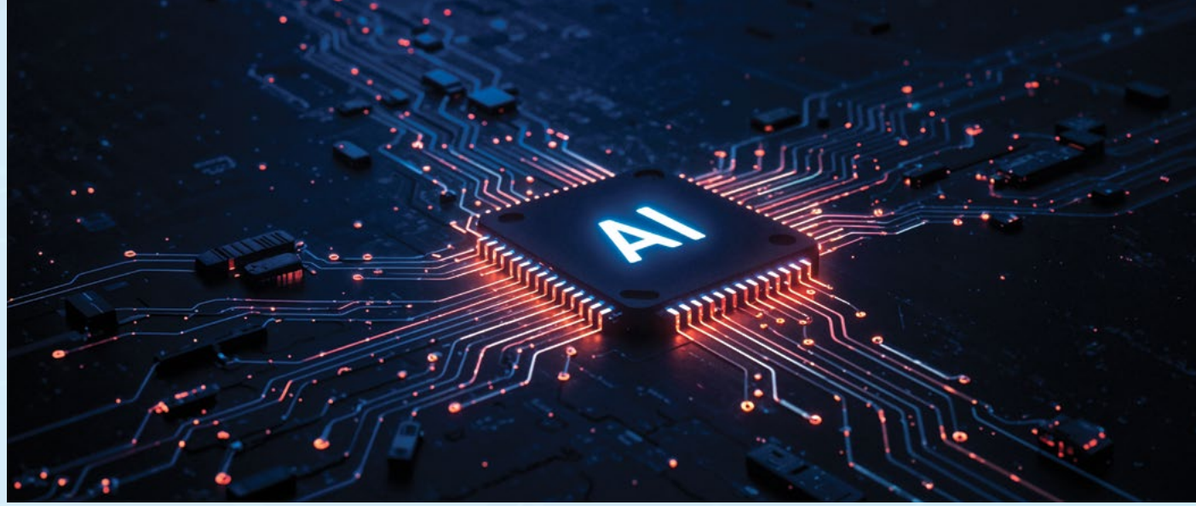
Despite the global trend to insource semiconductor manufacturing, Singapore semiconductor scene has also seen solid growth in recent years as Singapore has benefited from being seen as a safe haven away from the chip war between the U.S and China. Western companies have been looking to set up alternative semiconductor supply chains outside of China and Taiwan, whilst Chinese companies have looked for non-US and non-Taiwan supply chains. As such semiconductor investment in Singapore has grown significantly in the last few years.

Singapore accounts for approximately 10% of the world's total semiconductor output and about 20% of global semiconductor equipment production. This positions Singapore as a significant player in the global semiconductor trade.

The trend from the last few years has also continued into 2025 with many new capacity investments coming on line or being announced.

In January Micron broke ground on its new High-Bandwidth Memory (HBM) advanced packaging facility adjacent to the company's current facilities in Singapore. Micron plans to invest US$7billion over the next several years to meet AI data center demand, with production due to start in 2026, with further expansion to 2027, creating 1400 jobs.

In April, Taiwanese foundry UMC officially opened its new Fab extension in Pasir Ris Wafer Park. The new 22nm Fab is planned to start production in 2026, ramping up to 30,000wafers per month capacity, creating 700 new jobs and bringing UMC's total capacity in Singapore up to more than 1 million 12 inch wafers per year.



In May, Singapore's R&D agency A*Star announced new initiatives and partnerships. It launched the world's first industry-grade 200mm Silicon Carbide (SIC) Open R&D Line to accelerate innovation and collaboration for Silicon Carbide devices. A*Star also launched phase 2 of its Lab-in-Fab, a 200mm R&D and manufacturing line focused on piezoelectric Micro-Electro-Mechanical Systems (piezoMEMS), involving partners STMicroelectronics, ULVAC, and the National University of Singapore. A*Star launched its EDA Garage to equip local companies with cost-effective advanced design tools, strengthening Singapore's Integrated Circuit design ecosystem. A*Star also formalized a partnership with GlobalFoundries and Nearfield Instruments to expand capabilities in advanced packaging and drive innovation in semiconductor metrology technologies.

In June, VisionPower Semiconductor Manufacturing Company (VSMC) celebrated its Fab topping out ceremony and is planning to move in the first tools in November. VSMC is a joint venture between NXP and Vanguard International Semiconductor (VIS) to build a new 12" wafer

The investment in the new VSMC Fab, has also led to Air Liquid announcing it will invest US$80 million to build a new air separation facility in Singapore to produce ultra-pure nitrogen, oxygen, and argon to supply VSMC and other local customers.

Also in June, the Frencken Group announced plans to invest $63 million in Singapore to consolidate its existing sites for efficiency and future expansion. Construction begins in Q3 2025 and is expected to be completed in Q1 2027. Frencken Mechatronics is a full-service supplier of high-precision industrial machinery and capital equipment to global OEMs in various industries, including semiconductors, medicine, analysis, and industrial automation.

This increased capacity investment means Singapore is well positioned to benefit from the growth of the global semiconductor industry in the coming years which is predicted to grow from around U$700billion to over US$1trillion by 2030.

Wrap up

Despite the turbulent start to the year with uncertainty over tariffs, the semiconductor industry has shown significant growth in the first half of 2025 and as long as there are no further major surprises on tariffs the global market is on track to show double digit growth this year driven by strong demand for AI and also the high end smartphone market. With the recent Capex investments in Singapore, our little red dot is well positioned to also benefit from this growth in the global electronics market especially once the automotive and industrial segments start growing again.

Contributed by, **Mark Dyson**,
Foundry Account Director

IS COPPER SINTERING THE KEY TO ADVANCING WIDE BAND GAP SEMICONDUCTORS?

In the mid- to high-voltage power semiconductor sector, which enables EVs, telecom networks, energy infrastructure, and industrial innovation, wide band gap (WBG) semiconductors like gallium nitride (GaN) and silicon carbide (SiC) are on their way to surpassing silicon (Si) for power discretes, power modules, and RF devices. Their projected annual growth rate of more than 13% over the next several years is proof of WBG's performance superiority for high-power, high-temperature, high-frequency applications where they offer exceptional efficiency, excellent thermal conductivity, and higher breakdown voltages, making them indispensable for cutting-edge technologies in high-stakes markets.

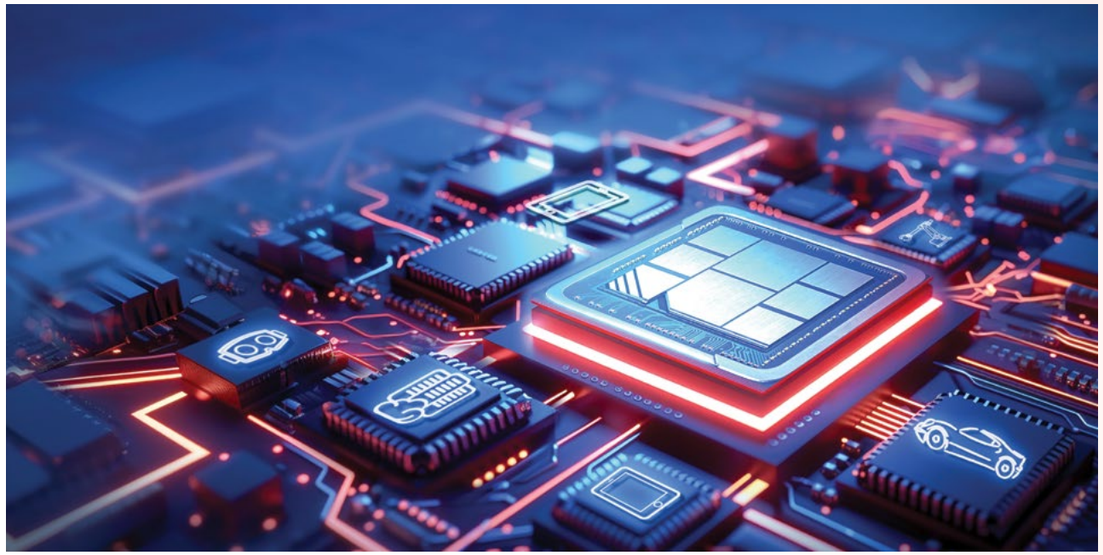
To fully harness the performance potential of WBG semiconductors, the die attach materials that bond the semiconductors to their packages must be able to cost-effectively accommodate WBG's high heat and ensure efficient power transfer. Because of its proven thermal and electrical conductivity advantages, sintering (where particles are bonded through heat and pressure into a solid metal layer) has become the preferred die/substrate attach method over traditional soldering, as it can provide exceptionally high thermal conductivities and cope with the high-temperature operating environments (>200° C) WBG devices experience in some applications. Silver sintering is arguably the industry standard, but new developments in copper pressure-assisted sintering materials are challenging silver sintering's dominance and have the potential to reshape the WBG semiconductor market.

Copper's Competitiveness Challenges Silver's Stronghold

Silver's high thermal conductivity (430 W/m-K) and electrical performance are why it has traditionally been favored for sintering WBG devices, even though it comes at a price premium. Copper, however, offers similar thermal conductivity at close to 400 W/m-K and electrical conductivity only slightly lower than silver. This performance parity at lower cost, combined with other advantages of copper, is driving copper-based sintering materials development that rivals – and in some cases exceeds – silver's advantages. These include:

Reliability: Copper sintered joints exhibit excellent mechanical strength, maintaining structural integrity through thermal cycling, which is critical for high-reliability applications like automotive and aerospace, where prolonged exposure to high temperatures, humidity, and stress are the norm. Compared to silver, copper demonstrates resistance to electromigration, helping to minimize the possibility of degraded long-term performance. Finally, copper's higher tensile strength and lower coefficient of thermal expansion (CTE) increase its potential for better reliability than silver-based materials.

Cost-of-Ownership and Sustainability: Copper is notoriously more economical than silver, with the ability to deliver lower cost-of-ownership in high-volume production operations. In addition to its cost advantage, copper is a sustainable material. Copper mining has a lower environmental impact than silver, is more abundant, and



recyclable. Finally, copper sintering processes have been shown to require less energy than silver sintering.

New Copper Sintering Technology Overcomes Obstacles to Power Ahead

Historically, the challenges with copper-based materials have centered on their sintering difficulty. Older-generation formulations required higher temperatures and higher pressures than silver materials to achieve complete sintering, which introduced potential damage to dies and substrates. However, advances in sintering environments and innovative formulation approaches are mitigating these concerns, enabling thorough copper sintering without the need for excessive pressure and temperature. For instance, Henkel's new pressure-assisted copper sintering material is engineered to overcome many shortcomings of conventional copper sintering formulas.

This groundbreaking material, leveraging proprietary copper filler technology, offers a compelling cost-of-ownership advantage versus silver-filled formulas, delivering thermal conductivity exceeding 300 W/m-K, reduced pressure (10-15 MPas) and temperature requirements (200° C – 250° C) for lower die stress, and faster processing time to accommodate mass production. The new pressure-assisted sintering formula is especially well-suited for current and next-generation SiC applications like power modules, ensuring high reliability and performance comparable to silver-based sintering solutions without the risk of die or substrate damage from the pressure and temperature required with other materials to achieve complete sintering.

As WBG semiconductors evolve, higher-performance, cost-effective sintering materials that can enable current and next-generation devices with high thermal and electrical capability, as well as more delicate processing parameters to mitigate potential device damage and preserve high yields, will help close the price-performance gap. New copper sintering formulations have the potential to leapfrog silver-based materials and offer manufacturers an innovative, competitive, sustainable, and cost-efficient advantage that can deliver the long-term reliability and exceptional performance necessary for the power sector.

Rejoy Surendran and Xinpei Cao
Henkel Adhesive Technologies

ENRICHING PEOPLE FOR TOMORROW:

SSMC'S BLUEPRINT FOR LEARNING, LEADERSHIP AND WORKFORCE TRANSFORMATION

SSMC's people-focused strategy emphasises creating a supportive learning environment, inspiring passion for growth, fostering leadership involvement and driving workforce development to prepare for future challenges in the semiconductor industry.

Creating a Learning Environment

At SSMC, we foster a dynamic learning environment by curating training curricula tailored to individual job profiles from Year 0 to Year 3. Every employee is encouraged to pursue continuous learning.

Beyond the core curriculum, we organise monthly Technical Knowledge Sharing sessions led by in-house experts and make different online platforms (eg. Udemy, SEMI University, IEEE, Datacamp, AI Singapore) accessible to employees to learn at their own pace. Programs are customised for various job levels, including New Manager's training and Leadership Excellence workshops. As a joint venture of NXP and TSMC, we leverage best practices through knowledge transfers and Best-Known-Method sharing. This is done through overseas training and exchange opportunities. This culture of curiosity ensures employees continuously develop skills and advance their careers.

Leadership Support for People Growth, Inspiring Passion for Learning & Problem-Solving

Effective leadership fosters people growth by harnessing the willingness to learn along the side of a strong mentorship program. SSMC provides platforms for our talents to engage in cross-functional projects, driving innovation and collaboration, we honour individuals who embrace challenges, quality and excel in delivering exceptional results.

SSMC development centre offers mentoring opportunities connecting talents with experienced leaders, this guided learning enhances problem-solving skills and inspires a passion for growth. High energy event like SSMC Hackathon unlocks employees' creative ideas and drive meaningful changes.

Also, we support staff in enhancing their academic standing through the Life-Long Learning Education Assistance Program (LEAP), offering tuition fee support and additional exam leave. Together, these elements inspire passion for learning and equip individuals with skills essential for professional development and success.

Strategic Workforce Development

As the talent competencies landscape continues to evolve at a much faster pace, what we think is the future can be at our doorstep already. Planning for the Workforce of the Future requires embracing technological disruptions (eg. AI that enhances efficiency and quality) while fostering agility, decisiveness, and adaptability in employees. To drive this transformation, we established a Strategic Thrust team focused on Digital Transformation and Productivity Excellence, aligning our skillsets with the demands of tomorrow's workforce.

Additionally, SSMC is empowering future ready workforce by collaborating with local educational and industry partners (eg. SSIA SSLA & SAY, SEMI WFD, SgIS, CCP). Together, we are enriching the semiconductor talent pool, shaping the future of our industry!

ssmc
(A Joint Venture of NXP and TSMC)

LAB-IN-FAB 2.0:

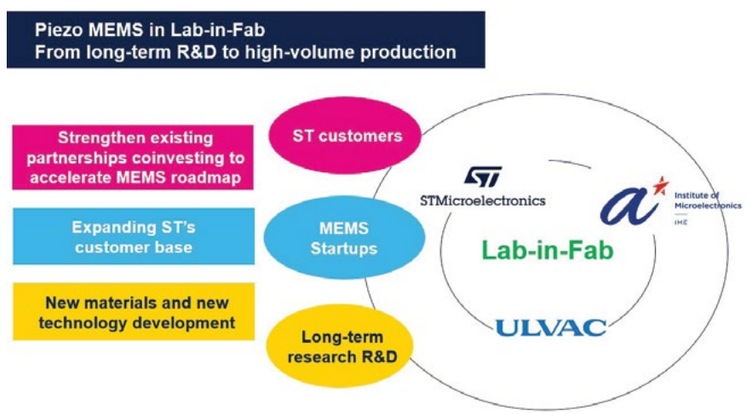
EXPANDED COLLABORATIONS LEAD TO INNOVATION AND TRANSFORMATION IN PIEZOELECTRIC MEMS

STMicroelectronics (ST) recently announced Lab-in-Fab 2.0, an expansion of the "Lab-in-Fab" initiative launched in 2020 that now includes new projects with Singapore's A*STAR Institute of Materials Research and Engineering (A*STAR IMRE) and the National University of Singapore (NUS). Located within STMicroelectronics's Singapore Ang-Mo-Kio campus, Lab-in-Fab is an 8-inch (200 mm) facility. The expansion will enable more startups and companies to accelerate development of piezoelectric MEMS and increase their adoption by reducing the time to market from a proof-of-concept to mass production. Put simply, this new milestone expands the scale and scope of Lab-in-Fab, making it more accessible and increasing its impact on the tech market.

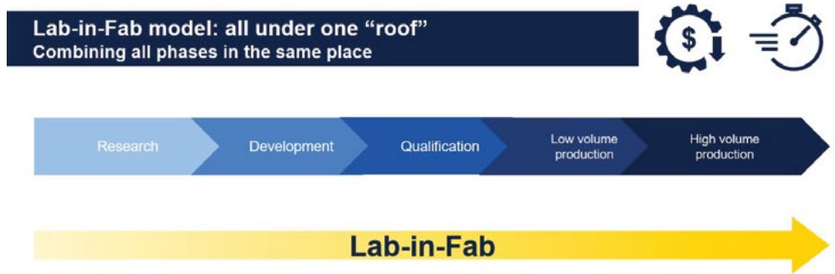
Lab-in-Fab was the world's first 8-inch (200 mm) STMicroelectronics manufacturing facility in Singapore with unique collaborative model.

The Lab-in-Fab is a cutting-edge facility that brings together STMicroelectronics, the A*STAR research institute, and Japanese manufacturing-tool vendor ULVAC—all under one roof. By combining R&D with high-volume manufacturing capabilities, it provides engineers with the tools and Mems technology platform to turn their ideas into reality faster, driving innovation and pushing the boundaries of Mems semiconductor technology.

Companies benefit from theoretical and practical expertise in one place to transform the piezoelectric MEMS market. And, according to professors from Peking University, ShanghaiTech University, and the Taiwan Semiconductor Research Institute, Lab-in-Fab 1.0 worked! They shared how it positively impacted their research, with prototypes deliveries reduced by two to 3 times. With multi-project wafers, they were able to receive prototypes within a couple of months.



Lab in Fab Operation Framework



Lab-in-Fab model

A direct path to high volume manufacturing

Too often, MEMS and sensor companies underestimate the expertise and investments it takes to go from concept to high-volume production. Many suffer from delays and high development costs because of unexpected issues during the prototyping phase or an inability to scale their production. Additionally, very few facilities can handle everything in-house. Consequently, manufacturers rely on multiple facilities, which often lead to additional delays, increased complexity, and higher overall costs.

Put simply, many struggle to find the right industrialization partner that can support them efficiently from their early-stage research all the way to their mass market launch.

Having STMicroelectronics, A*STAR, and ULVAC together means that clients can work with a broader range of experts. Moving from R&D to production is easier. Similarly, optimizing high-volume manufacturing, which is a vital issue in this field, will also be more straightforward.

The need for greater flexibility

Researchers continually devise new tools and ideas. Unfortunately, they often lack the necessary equipment or facilities for testing. Lab-in-Fab offers a unique approach to experimentation. The project provides significant flexibility by allowing some clients to utilize Lab-in-Fab solely to address specific challenges. We are committing to provide maximum flexibility to support engineers, allowing them to focus on addressing key issues rather than being constrained by infrastructural challenges.

In essence, the primary objective of this facility is to establish itself as a global leader in microsystems research while supporting customers in their journey to the industrialization of leading-edge sensor and actuator products. Through Lab-in-Fab, customers have the unique opportunity to develop advanced products using state-of-the-art R&D facilities, all embedded in a high-volume-capable facility, enabling faster transition to volume production. By combining world-class R&D personnel, key semiconductor equipment, and access to the complete IME's and STMicroelectronics's development ecosystem, Lab-in-Fab provides an expanded set of services for companies seeking to develop and manufacture MEMS-based products.

Finally, STMicroelectronics reached out to smaller companies. Many say they sometimes feel left out of initiatives like Lab-in-Fab. As a result, we created STMicroelectronics for Startups, a program specifically designed for emerging companies. Once accepted, startups gain access to STMicroelectronics experts, advanced manufacturing innovations, and assistance in developing new IP. Thanks to multi-project wafers, they also get the latest technologies and platforms that STMicroelectronics has to offer, enabling them to create rapid proof-of-concepts, test feasibility, and more. They can even leverage STMicroelectronics's marketing activities to shine a brighter light on their project.

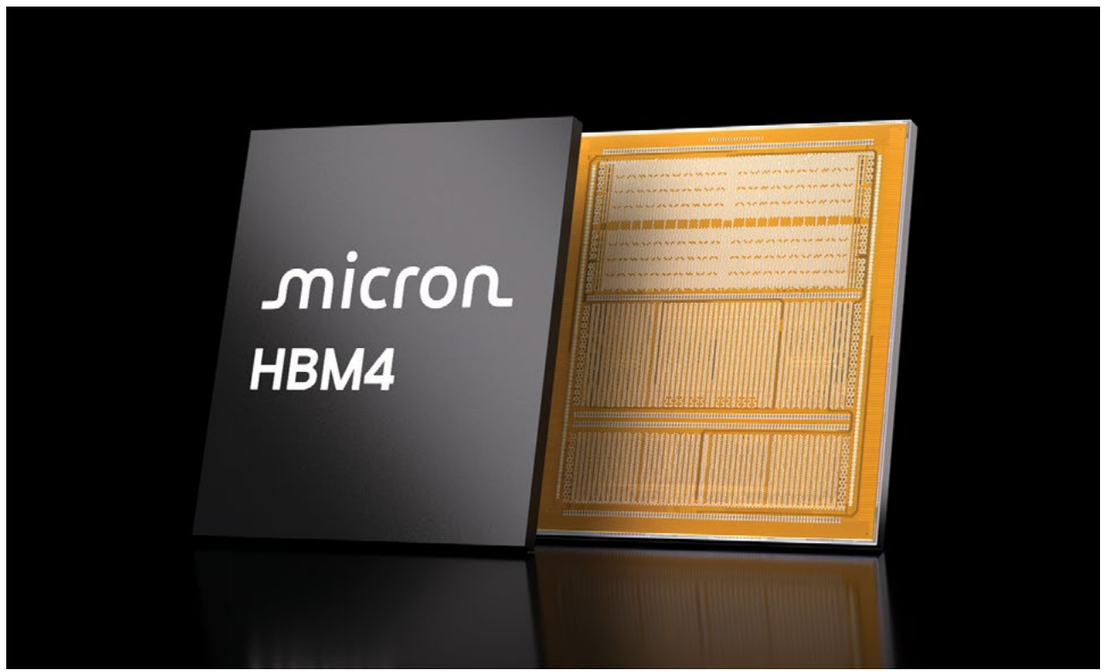
For collaboration enquiries about Lab-in-Fab, you can write to: *lab_in_fab@list.st.com*.

STMicroelectronics

MICRON SHIPS HBM4 TO KEY CUSTOMERS TO POWER NEXT-GEN AI PLATFORMS

Micron HBM4 36GB 12-high products lead the industry in power efficiency for data center and cloud AI acceleration

BOISE, Idaho, June 10, 2025 (GLOBE NEWSWIRE) — The importance of high-performance memory has never been greater, fueled by its crucial role in supporting the growing demands of AI training and inference workloads in data centers. Micron Technology, Inc. (Nasdaq: MU), today announced the shipment of HBM4 36GB 12-high samples to multiple key customers. This milestone extends Micron's leadership in memory performance and power efficiency for AI applications. Built on its well-established 1ß (1-beta) DRAM process, proven 12-high advanced packaging technology and highly capable memory built-in self-test (MBIST) feature, Micron HBM4 provides seamless integration for customers and partners developing next-generation AI platforms.



A leap forward

As use of generative AI continues to grow, the ability to effectively manage inference becomes more important. Micron HBM4 features a 2048-bit interface, achieving speeds greater than 2.0 TB/s per memory stack and more than 60% better performance over the previous generation.[1] This expanded interface facilitates rapid communication and a high-throughput design that accelerates the inference performance of large language models and chain-of-thought reasoning systems. Simply put, HBM4 will help AI accelerators respond faster and reason more effectively.

Additionally, Micron HBM4 features over 20% better power efficiency compared to Micron's previous-generation HBM3E products, which first established new, unrivaled benchmarks in HBM power efficiency in the industry.[2] This improvement provides maximum throughput with the lowest power consumption to maximize data center efficiency.[2]

Generative AI use cases continue to multiply, and this transformative technology is poised to deliver significant benefits to society. HBM4 is a crucial enabler, driving quicker insights and discoveries that will foster innovation in diverse fields such as healthcare, finance and transportation.

"Micron HBM4's performance, higher bandwidth and industry-leading power efficiency are a testament to our memory technology and product leadership," said Raj Narasimhan, senior vice president and general manager of Micron's Cloud Memory Business Unit. "Building on the remarkable milestones achieved with our HBM3E deployment, we continue to drive innovation with HBM4 and our robust portfolio of AI memory and storage solutions. Our HBM4 production milestones are aligned with our customers' next-generation AI platform readiness to ensure seamless integration and volume ramp."

Intelligence Accelerated: Micron's role in the AI revolution

For nearly five decades, Micron has pushed the boundaries of memory and storage innovation. Today, Micron continues to accelerate AI by delivering a broad portfolio of solutions that turn data into intelligence, fueling breakthroughs from the data center to the edge. With HBM4, Micron reinforces its position as a critical catalyst for AI innovation and a reliable partner for our customers' most demanding solutions.

Micron plans to ramp HBM4 in calendar year 2026, aligned to the ramp of customers' next-generation AI platforms.

Scan QR discover Micron HBM4

https://www.micron.com/products/memory/hbm

micron

[1] Based on internal Micron HBM4 testing and published HBM3E specifications (2.0 TB/s vs. 1.2 TB/s).
[2] Based on internal Micron simulation projections in comparison to Micron HBM3E 36GB 12-high and similar competitive products.

MICRON SHIPS WORLD'S FIRST 1γ (1-GAMMA)-BASED LPDDR5X, ENABLING RICH MOBILE AI EXPERIENCES

Designed for flagship smartphones, Micron LPDDR5X memory delivers top speed grades and dramatic power savings in industry's thinnest package

BOISE, Idaho, June 03, 2025 (GLOBE NEWSWIRE) — Micron Technology, Inc. (Nasdaq: MU), announced today that it is shipping qualification samples of the world's first 1γ (1-gamma) node-based low-power double data rate 5X (LPDDR5X) memory, designed to accelerate AI applications on flagship smartphones. Delivering the industry's fastest LPDDR5X speed grade of 10.7 gigabits per second (Gbps), combined with up to a 20% power savings,[1] Micron LPDDR5X transforms smartphones with faster, smoother mobile experiences and longer battery life — even when executing data-intensive workloads such as AI-powered translation or image generation.

To meet the industry's increasing demand for compact solutions for next-generation smartphone designs, Micron's engineers have shrunk the LPDDR5X package size to offer the industry's thinnest package of 0.61 millimeters,[2] making it 6% thinner compared to competitive offerings,[3] and representing a 14% height reduction from the previous generation.[4] The small form factor unlocks more possibilities for smartphone manufacturers to design ultrathin or foldable smartphones.

"Micron's 1-gamma node-based LPDDR5X memory is a game-changer for the mobile industry," said Mark Montierth, corporate vice president and general manager of Micron's Mobile and Client Business Unit. "This breakthrough technology delivers lightning-fast speeds and remarkable power efficiency — all within the industry's thinnest LPDDR5X package — paving the way for exciting new smartphone designs. This solution demonstrates our commitment to empowering the ecosystem to create extraordinary mobile experiences."

The company's 1γ-based LPDDR5X enables dramatic leaps in performance for mobile users by enabling faster AI insights. For example, Micron evaluated mobile AI response times from large language model Llama 2, based on 1γ LPDDR5X's 10.7 Gbps bandwidth compared to 1β (1-beta) LPDDR5X's 7.5 Gbps bandwidth,[5] finding:

- Responses are 30% faster when asking for location-based restaurant recommendations.
- Results are more than 50% faster when translating a voice inquiry in English to text in Spanish to ask for directions.
- Responses can be up to 25% faster when requesting car purchase recommendations based on vehicle type, affordability and certain infotainment and safety features.[6]

Now ramping in Micron's mobile portfolio, Micron's 1γ-based LPDDR5X is the company's first mobile solution to leverage advanced EUV lithography — providing customers with early access to the latest performance and power efficiency advancements, based on the industry's most advanced memory node technology. This milestone builds on Micron's February sampling of 1γ-based DDR5 memory for next-generation CPUs in the data center and client segments. Micron's optimized 1γ DRAM node leverages CMOS[7] advancements like next-generation high-K metal gate technology for improved transistor performance and incorporates leading-edge EUV lithography for enhanced bit density.

As energy-intensive mobile AI workloads are increasingly processed on-device rather than only in the cloud, low-power chips are crucial for devices like smartphones, tablets and laptops, which need to conserve power while performing AI computations.

Micron's 1γ-based LPDDR5X's significant 20% power savings will allow mobile users to enjoy their favorite AI applications, games and video content longer on a single charge. In addition, as AI intensifies the need for powerful, energy-efficient compute, data center servers, intelligent vehicles and AI PCs may also increasingly adopt LPDDR5X for its unique blend of optimized power efficiency and high performance.

Micron is currently sampling 1γ-based LPDDR5X 16 gigabyte (GB) products to select partners and will offer a wide range of capacities from 8GB to 32GB for use in 2026 flagship smartphones.

Scan to explore LPDDR5X details

https://www.micron.com/products/memory/dram-components/lpddr5x

micron

[1] Compared to Micron's previous generation LPDDR5X
[2] Package thickness varies based on capacity; 0.61mm thickness for Micron's 8GB and 16GB 1γ-based LPDDR5X 496-ball packages.
[3] Based on Micron's competitive market research and intelligence, with competitive offerings measuring at 0.65 mm thick
[4] Based on a thickness of 0.71mm for Micron's 1β-based LPDDR5X for 16GB
[5] Examples below are based on extrapolation of data from devices using LPDDR5X running at 9.6 Gbps and 7.5 Gbps.
[6] Based on a test asking Llama 2 to recommend 10 SUVs while prioritizing user requirements such as affordability, Apple CarPlay and essential safety features such as emergency braking, blind spot monitoring, parking sensors and all-wheel drive. Recommendations given were within a budget of $23,000 to $37,000.
[7] Complementary metal-oxide semiconductor

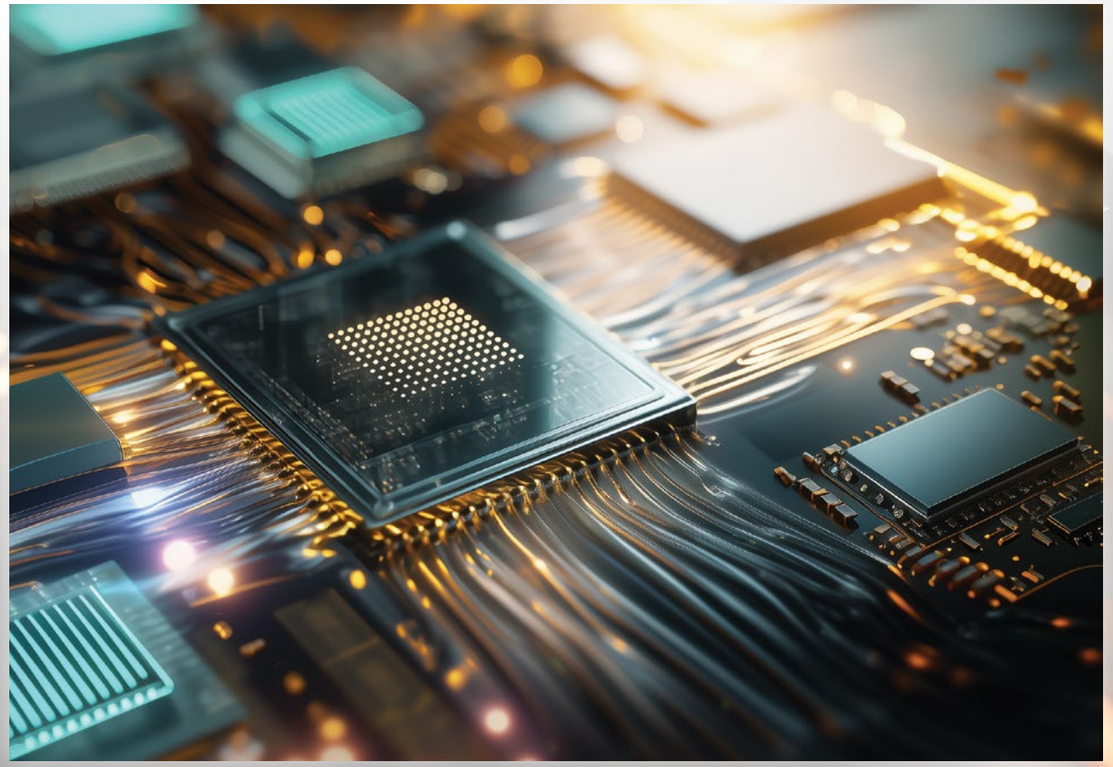
Ecosystem Cultivation for Global Impact

LIGHTING THE WAY:

NICSLAB POWERS THE FUTURE OF INTEGRATED PHOTONICS

In an era shaped by AI, high-speed connectivity, and the fusion of electronics and photonics, the demand for **fabless companies driving the development of integrated photonic chips** is accelerating. These chips are becoming foundational to next-generation technologies—but unlocking their potential requires enabling infrastructure for design, validation, and deployment. Rising to meet this need is **Nicslab**, a **fabless integrated photonic chip design company** committed to advancing photonic-enabled systems.

Headquartered in the United States, with **Indonesia as its manufacturing hub in Southeast Asia**, Nicslab has developed a high-performance **testing and control platform**—a strategic enabler for **Photonic Integrated Circuit (PIC)** development. This platform simplifies optical testing, signal conditioning, and system control, supporting both R&D and production in industries where precision and scalability are essential.



Ecosystem Cultivation for Global Impact

In 2024, Nicslab was named **“Company of the Year”** by the **Luminate Accelerator in New York**, one of the world’s premier optics and photonics startup programs. The recognition marked a key milestone in Nicslab’s journey, highlighting its leadership in making photonic technology more **affordable, accessible, and scalable**.

In **Singapore**, Nicslab is open to **partnerships with advanced manufacturing companies and semiconductor enablers**, tapping into the region’s robust fabrication and supply chain ecosystem to accelerate its roadmap from test systems to full-scale PIC development.

Nicslab’s solutions have already reached **over 20 countries**, empowering applications in **semiconductor manufacturing, AI, data centers, telecommunications, and space technologies**. By providing practical, scalable tools today, Nicslab is laying the groundwork for the integrated photonic chips of tomorrow.

As **photonic technology** becomes central to future computing and communication, Nicslab leverages its **fabless design expertise, advanced testing solutions, and global partnerships** to translate emerging industry needs into **scalable, real-world innovations**.

We see Southeast Asia—especially Singapore and Indonesia—as a promising region to support with accessible, high-quality solutions for real-world adoption of photonic integrated chips

- Dr. Andri Mahendra,
Co-founder & CEO of Nicslab

nicslab

A GLOBAL PLATFORM,
ROOTED IN SINGAPORE:

GIGADEVICE'S NEXT LEAP FORWARD

On June 3rd 2025, GigaDevice officially opened its Global Headquarters in Singapore, marking a pivotal milestone in the company's ongoing journey as a globally integrated semiconductor platform The opening ceremony was attended by Singapore EDB, SSIA Executive Director Mr. Wee Seng Ang, GigaDevice Chairman Mr. Yiming Zhu, Co-founder Mr. Kevin Shu, CEO Hong Hu, Global Business CEO Jennifer Zhao , as well as customers, distributors and supply chain partners. This strategic setup reflects more than geographic expansion, it signals a fundamental shift in how GigaDevice connect, collaborate, and compete in an increasingly borderless tech landscape.

"We are thrilled to have GigaDevice join Singapore's vibrant semiconductor community," **said Mr. Ang Wee Seng, Executive Director of the Singapore Semiconductor Industry Association (SSIA).** *"It marked more than a milestone. It symbolized a growing belief that Singapore is not just a place to do business, but a place to build futures"*

In the past two decades, GigaDevice has grown from a single Flash product line into a technology powerhouse, with a portfolio that now spans memory, microcontrollers, analog, and sensors. While its global footprint has expanded steadily, the establishment of the Singapore headquarters represents a decisive leap toward a more agile and connected future.

Why Singapore? Where Values Meet Velocity

The decision to anchor GigaDevice's global headquarters in Singapore wasn't just a business decision, it was a values-driven one.

Singapore offers a rare combination of stability, innovation, and community in today's rapidly evolving world. Its central location in Asia, openness to international business, and deep pool of technical talent made it an ideal fit.

"There's a quote by Mr. Lee Kuan Yew I really like: *We have no natural resources. We have only our people*," said **Jennifer Zhao, GigaDevice Global Business CEO.** "This city-state may be small on the map, but it plays really big, it is a true crossroads of East and West. But more than that, what stood out to us was the mindset: forward-looking, decisive, incredibly capable."

GigaDevice selected Singapore for its alignment in values, long-term, systems-oriented, and people-first innovation. The company sees in Singapore a platform that enables purposeful, high-impact growth.

A Super-Node in a Connected World

In today's distributed technology landscape, innovation occurs across multiple time zones. Design may begin in Shanghai, firmware may be fine-tuned in Santa Clara, and customer insights may flow in from Munich or Osaka. GigaDevice has long embraced this global reality. The new Singapore headquarters is designed to enhance this model, making it faster, smarter, and more customer-centric.

As a central command hub, it will connect regional operations, deepen customer engagement, and drive end-to-end supply chain agility. With leadership, engineering, and commercial functions embedded in Singapore, the company gains proximity to key markets and strengthens its responsiveness. Whether it's adapting a chipset for a specific automotive platform or collaborating on Edge AI technologies, the headquarters will enable GigaDevice to accelerate the path from development to real-world application.

More importantly, the headquarters is structured to power long-term value creation. GigaDevice is investing in talent development and building a globally minded team that blends technical expertise with local insight. The company also plans to partner with industry alliances, universities, and research institutes to co-develop next-generation technologies, contributing meaningfully to Singapore's innovation ecosystem.

Looking Ahead: A Platform for What's Next

The semiconductor industry today is more critical and more complex than ever. It sits at the core of every major transformation: Edge AI, green energy, automotive and connectivity. In this dynamic context, speed matters, so does relevance, so does resilience.

For GigaDevice, the Singapore headquarters is not a final destination, but a growth engine. It is designed to transform engineering velocity into customer value, local feedback into global solutions, and strategic intent into long-term impact. The hub will strengthen GigaDevice's integration and decision-making across Southeast Asia, EMEA, and the Americas.

"We've spent the last two decades building with purpose. And now, we're right in that golden age of a tech company, stronger, faster, and hungrier than ever," **said Jennifer**, *"This moment marks not just a strategic expansion, but the beginning of deeper partnerships-with Singapore, with Asia, and with Europe, America."*

And this is just the beginning.

GigaDevice

SUPPLY CHAIN RESILIENCE:

HOW TO TURN DISRUPTION INTO OPPORTUNITY

Not so long ago, the average person probably didn't spend much time thinking about supply chains. Now though, due to the events of the last decade or so, supply chains – or supply chain resilience to be more exact – has very much become a topic *du jour*.

There's no denying that businesses have had a lot to deal with lately. A particularly diverse set of challenges that have laid bare the vulnerability of how even the biggest and most powerful organisations operate. Yet our research shows that, despite these challenges, 89% of businesses in Asia Pacific still do not operate a resilient supply chain. And that should be a concern for all of us.

In a recent report, NCAPEC defined a resilient supply chain by five key dimensions– flexibility, visibility, connectivity, robustness and redundancy. Whether you've heard it referred to as nearshoring, diversification, China Plus or something else, businesses all over the world are exploring various strategies to address these five metrics. What they all have in common is the need for a ready-made plan B – a backup plan you can easily turn to when plan A isn't available.

At UPS, we offer a range of proprietary solutions designed to strengthen supply chains and reduce operational risk. This includes the hardware – backup transportation options, customised packaging and warehouse optimisation for example. Or the software – digital tools such as intelligent asset tracking to provide enhanced visibility and control over every link in the supply chain through the use of technology such as RFID tags. And just about everything in between.

When a business chooses to partner with UPS, they instantly access a smart logistics network that delivers worldwide as soon as the next business day. An airline that operates a fleet of over 570 aircraft. The world's largest customs broker. A solution to every problem.

Asia Pacific is the heartbeat of global trade. We've been here since the 1980s and we've been through a lot. We've helped our customers through even more.

So, the question you need to ask yourself today is, the next time there's disruption to global supply chains, the next time there's a chance to turn a challenge into an opportunity, will you be ready?

Schedule your free consultation today.

WESTERN PNEUMATIC:

STRENGTHENING SINGAPORE'S SEMICONDUCTOR ECOSYSTEM THROUGH STRATEGIC PARTNERSHIPS & INNOVATIVE PNEUMATIC SOLUTIONS

Incorporated in 1981, **Western Pneumatic Pte Ltd** is a Singapore-based engineering company dedicated to delivering innovative and sustainable pneumatic and fluid transfer solutions tailored to meet the needs of complex industrial environments.

With over four decades of experience, we have earned a reputation for excellence in the design, supply, and installation of centralised vacuum and pneumatic systems.

At the core of our operations lies a meticulous commitment to quality and customer satisfaction. Our engineering solutions are trusted by a wide spectrum of clients - from multinational corporations (MNCs) to local SMEs, as well as government and research institutions - across sectors such as semiconductors, pharmaceuticals, oil and gas, electronics, chemicals, and life sciences.

Our strength lies in turnkey project delivery. Leveraging deep technical expertise, we offer end-to-end solutions encompassing engineering design, procurement, fabrication, installation, testing, and commissioning. We are especially proud to have been recognised for our role in one of Singapore's benchmark semiconductor manufacturing projects - where our vacuum system design and integration met stringent operational and quality standards.

Our Project Team receiving the Quality Excellence Award from a Singapore Semiconductor MNC

Quality Excellence Award from a Singapore Semiconductor MNC
(Company names have been omitted to protect Owners rights)

To meet the demands of a fast-tracked timeline, we implemented innovative approaches such as off-site pre-fabrication and leakage testing of pipe spools. These methods enabled efficient project delivery without compromising on quality. Our proactive and collaborative approach - working closely with project stakeholders and valued partners - was instrumental in meeting critical Ready-For-Equipment (RFE) milestones.

We are honoured to receive an industry recognition award for Quality Excellence - an affirmation of our pursuit of continuous improvement and flawless execution.

This milestone is a testament to the strategic partnership and strong collaboration between MNCs, SMEs such as Western Pneumatic and underscores our position as a reliable partner in Singapore's advanced manufacturing ecosystem. Western Pneumatic remains steadfast in our mission to support the nation's growth as a global semiconductor hub, through innovative engineering, strategic partnerships, and an unwavering commitment to excellence.

Western Pneumatic Pte Ltd
www.westernpneumatic.com

- Centralised pneumatic and fluid transfer solutions
- Engineering design and project management
- System and equipment audit, troubleshooting and maintenance
- Vacuum equipment replacement, repair and overhaul
- Supply of equipment, repair kits and consumables

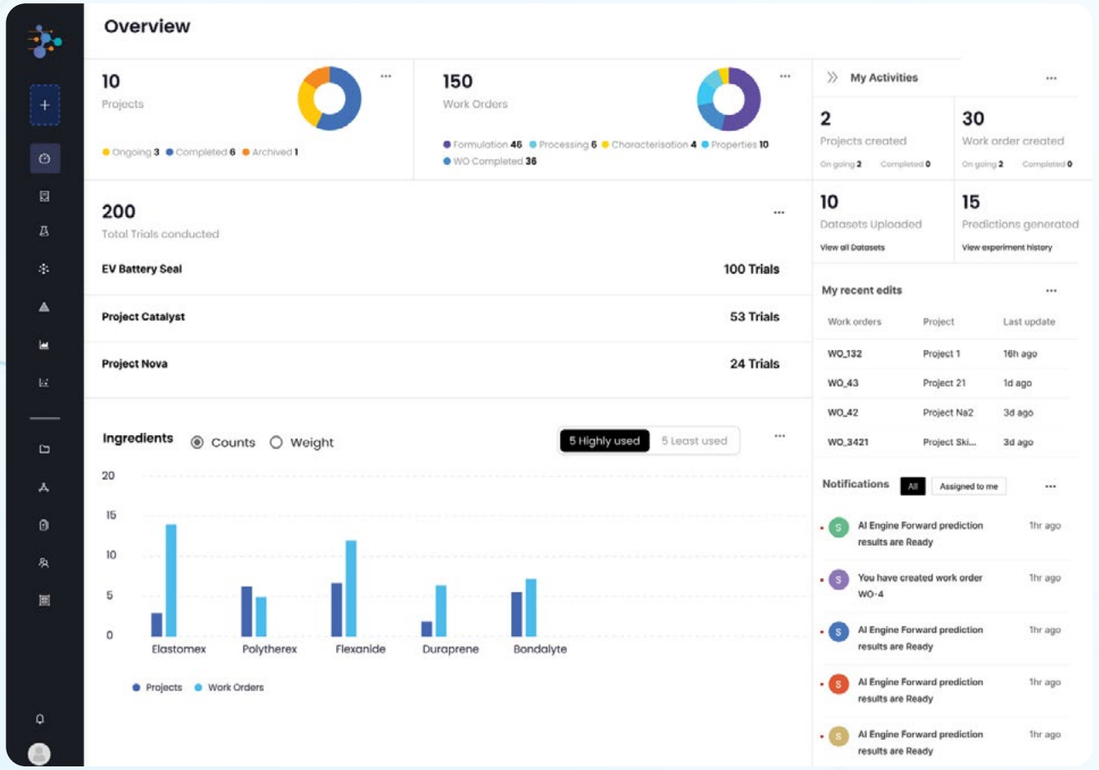
AI-POWERED MATERIALS INFORMATICS IS RESHAPING SINGAPORE'S SEMICONDUCTOR R&D

As Singapore strengthens its global leadership in semiconductors, materials innovation has become a strategic priority. The ability to rapidly develop and optimize advanced materials is becoming increasingly critical. Materials are no longer passive enablers—they are active performance drivers in applications such as chip packaging, thermal management, and flexible electronics.

Polymerize is doing exactly that—empowering enterprises to design high-performance materials faster, more efficiently, and sustainably.

Headquartered in Singapore, Polymerize offers a full-stack materials informatics platform that integrates data management, proprietary AI models, and experimental design workflows into a seamless, end-to-end solution. This unified approach enables R&D teams to move from silos data to valuable experimental insights within a single environment—dramatically reducing overall development time, cost, and human labour.

In the semiconductor industry, materials such as high-performance polymers and specialty chemicals are essential across advanced packaging,



wafer-level encapsulation, photoresists, and thermal interface materials. These materials must meet stringent standards for purity, thermal stability, dielectric properties, and long-term reliability. Yet, traditional formulation processes remain time-consuming and heavily dependent on trial biased iterations. At the core of Polymerize's approach is its ability to learn from real-world experimental data. By capturing how materials behave under actual formulation and processing conditions, the platform's AI models—built alongside deep domain expertise—can predict critical properties such as glass transition temperature, thermal conductivity, and mechanical strength with over 95% accuracy. This enables researchers to simulate, refine, and shortlist candidate formulations before stepping into the lab—accelerating development and reducing overall waste.

Polymerize is actively supporting local chemical manufacturers and global semiconductor suppliers in the following areas:

- Fan-out Wafer-Level Packaging (FOWLP): Collaborating with material suppliers to optimize underfill and encapsulant formulations with improved flowability and cure profiles.

- Flexible Hybrid Electronics: Partnering with manufacturers to develop UV-curable resins and adhesives with controlled modulus and thermal expansion for flexible circuit integration.

- Thermal Interface Materials: Assisting in the design of high thermal conductivity fillers in polymer matrices for heat-dissipation layers in advanced logic packages.

- Photoresist Formulations: Working with R&D labs to model cross-linking behavior and film uniformity under various bake and exposure conditions—reducing the need for repeated wafer runs.

These real-world collaborations highlight how Polymerize goes beyond theory—helping customers unlock new material performance, shorten R&D cycles, and respond quickly to new technology nodes and packaging requirements. Through partnerships with research institutions and industry players in Singapore, the company is accelerating the development of foundational materials critical to next-generation electronics.

Sustainability is also a core pillar of Polymerize's mission. By reducing waste, shortening development cycles, and eliminating redundant testing, the platform supports Singapore's vision for efficient and sustainable manufacturing.

For semiconductor innovators looking to enhance speed, precision, and sustainability in materials development, Polymerize offers a proven path forward—connecting experimental insights with predictive intelligence in a single, scalable platform.

Polymerize
Redefining the **Future of Material Innovation**
Faster, Smarter and More Sustainable
Schedule a demo
www.polymerize.io | contact@polymerize.io
Polymerize

PRECISION INTEGRATION, ECOSYSTEM COLLABORATION:

API EMPOWERS SINGAPORE'S SEMICONDUCTOR ECOSYSTEM DEVELOPMENT

As the global semiconductor industry accelerates toward heterogeneous integration and advanced packaging, Singapore – leveraging its mature industrial ecosystem and robust innovation capabilities – is rapidly emerging as a strategic hub for technological advancement. As a high-end equipment manufacturer specializing in precision placement and advanced packaging solutions, API recognizes Singapore's pivotal role as a global technology center. We are committed to empowering sustainable innovation and breakthroughs in Singapore's semiconductor ecosystem through our closed-loop technological approach of "precision design – process innovation – intelligence".

API intelligent manufacturing center

API has deep insights into Singapore's strategic needs in silicon photonics, high-density memory, Chiplet integration and advanced packaging. With our elite R&D team, world-leading precision manufacturing systems, and extensive industrialization experience, we have earned high recognition from leading global semiconductor manufacturers. Building upon our precision pick-and-place systems as the technological foundation, API has established a comprehensive product portfolio covering core semiconductor packaging processes, delivering full value-chain services from individual equipment to complete production line solutions.

Our product matrix serves diverse fields including memory, communications, automotive, and AI. Through our integrated design philosophy combining "precision machinery + AI algorithms + process integration", we provide strong support for cutting-edge technologies such as Chiplet heterogeneous integration and 2.5D/3D packaging.

In Singapore, API will steadfastly implement our philosophy of "technology sharing, ecosystem co-creation, and collaborative success" by focusing on three key partnership dimensions to strengthen local capabilities and enrich the industrial ecosystem:

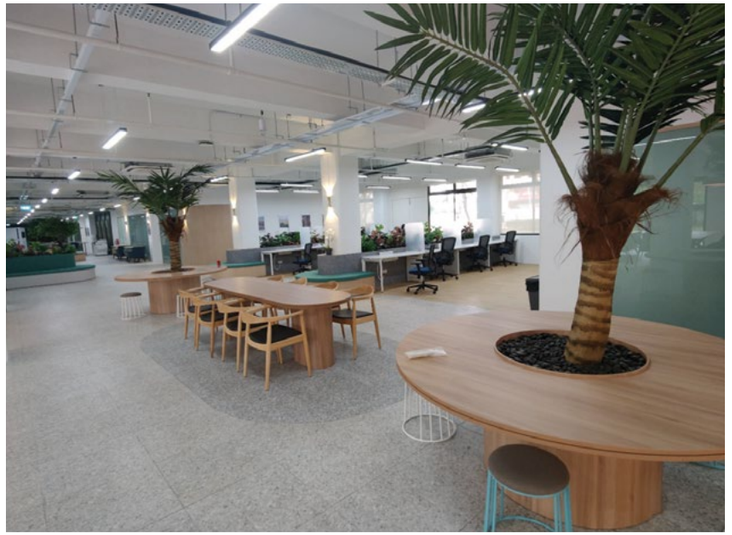
1. Establishing Joint Laboratories: Deep collaboration with local universities and research institutions to co-build advanced packaging joint labs, accelerating local R&D and technology commercialization.

2. Developing Talent Ecosystem: Launching our "Global Talent Program" to attract outstanding local graduates and professionals, offering diverse internship and employment opportunities to cultivate future semiconductor experts.

3. Collaborating on Green Manufacturing: Committing to sustainable development through joint development of low-power processes, application of eco-friendly materials, and upgrading intelligent management systems to optimize energy efficiency – helping Singapore achieve breakthroughs in both technological innovation and green development.

The prosperity of Singapore's semiconductor ecosystem requires deep integration of global innovation forces. With our cutting-edge precision technologies, open collaboration philosophy, and proven industrialization capabilities recognized by international leaders, API looks forward to becoming a key technology partner in Singapore's semiconductor ecosystem.

Let us join hands to propel Singapore's advancement as a global innovation hub and technology leader in advanced packaging!



API office overview

API in SEMICON SEA 2025

BUILDING THE FUTURE OF SEMICONDUCTORS THROUGH STRATEGIC GROWTH

aerial view SQ1 Building

On 2nd June2025, **VDL Enabling Technologies Group (Singapore) Pte Ltd** officially opened its new SQ1 Office-Warehouse building — a major step forward in strengthening its position in Singapore's semiconductor manufacturing ecosystem. This expansion is a part of VDL Groep's strategic plan for further investment over the next five years. More than just infrastructure, SQ1 reflects VDL's long-term commitment to its global customer base and local capability-building.

As a strategic and dependable tier-1 contract manufacturer for four of the top five semiconductor wafer fab equipment (WFE) makers globally, our customers depend on us to deliver critical mechatronic modules and ultra-high vacuum platforms and process modules, used in the cutting-edge semiconductor wafer fabrication processes.

With over five decades in Singapore, VDL ETG Singapore has steadily cultivated homegrown talent through structured upskilling, internship programs, and International Work Exchange Program. These initiatives have helped us maintain the vitality for innovation and advanced manufacturing. As Managing Director **Chiam Sing Chung** shares, "Our vision is to be the role model for

SQ1 Opening Day Tree Planting Ceremony

smart manufacturing — powered by hardware, software, and most importantly, heartware." By creating the most inspiring workplace for our employees, we strive to foster a sense of ownership, inclusivity and shared purpose across the organization to meet the challenges and opportunities of tomorrow.

The SQ1 building was built with both collaboration and sustainability in mind. The 3-storey warehouse and 4-storey office was completed in a sprint of less than 2 years, yet the building encompasses state-of-the-art features such as collaborative spaces, customer lounges, green rooftop gardens, and sustainable energy solutions – all designed to enhance employee experience while safeguarding intellectual property and improving customer satisfaction.

With strong partnerships across industry, VDL ETG Singapore is proud to be a catalyst for a robust, resilient and future-ready semiconductor ecosystem in Singapore.

Opening Speech - Managing Director, Chiam Sing Chung

About VDL Groep: *VDL Groep has over 14,000 employees in 20 countries. The group encompasses more than 100 closely cooperating operating companies, each with its own specialism. In 2024, VDL Groep achieved a combined annual turnover of €4.3 billion. As a family business founded in 1953, we cherish the values of workmanship, deliberateness and cooperation.*

For more information about VDL Groep, visit: ***www.vdlgroep.com/en***

To learn more about VDL ETG Singapore, visit: ***https://www.linkedin.com/company/vdl-etg-singapore/***

VDL ETG SINGAPORE

NANO-PRECISION MOTION SOLUTIONS FOR
ADVANCED PACKAGING & AOI APPLICATIONS:

PBA SYSTEMS STRENGTHENS SINGAPORE'S SEMICONDUCTOR ECOSYSTEM

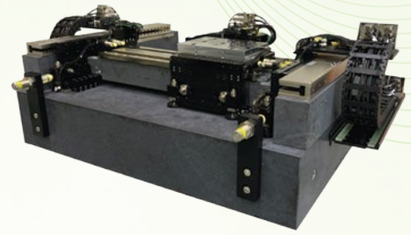
PBA Systems is playing a pivotal role in shaping Singapore's Semiconductor Ecosystem. With nearly 40 years of expertise in ultra-precision direct drive technology and nano-grade high precision stage solutions, PBA is a homegrown leader helping to build a competitive and resilient ecosystem.

PBA's cutting-edge technologies power the most demanding high-precision motion solutions used in semiconductors, AOI inspections, photonics, and medical device applications. They are trusted partner for MNCs, SMEs, and OEM machine builders alike. PBA offers solutions to nano precision levels from process-to-motion. Specializing in high-complexity multi-axis systems, PBA provides fast custom design and delivery services.

Anchoring Local Collaboration

PBA actively collaborates with key stakeholders—government agencies, academia, and industry partners, such as research partnership with Applied Materials—to uplift the sector. These partnerships foster innovation, enhance local R&D, and strengthen supply chain resilience. At the core of this collaboration is advanced packaging, where PBA is driving co-innovation to enable the packaging of next-generation technology.

Ultra-Precision High Dynamic Dual Gantry



PABG1000

Innovation in Motion

At the forefront of PBA's innovation is the nano-grade Ultra-Precision XY Dual Gantry Motion System, a cutting-edge automation platform designed for advanced packaging. This system offers precise movement across four controlled axes, enabling the simultaneous processing of multiple tasks. With a dual gantry design, it supports complex processes and motions that are critical in semiconductor manufacturing, maximizing throughput while maintaining the highest levels of accuracy.

The system is engineered for demanding die bonding applications, such as Flip-chip, μ-LED bonding, and dispensing, delivering ±350nm placement accuracy and speeds of up to 8,000 units per hour. This star product also comes with Controllable Thermal Expansion Technology design, which ensures heat insulation to prevent thermal expansion that can degrade accuracy, ensuring optimal performance even in challenging environments.

The dual gantry design also offers significant advantages in terms of space and flexibility. By consolidating complex movements into a single system, the dual gantry configuration can often be more compact and flexible than using two separate systems, which reduces semiconductor manufacturing floor space.

Building Talent and Sustainability

Beyond technology, PBA partners with universities and research institutions to nurture precision engineering skills and support next-generation workforce readiness.

As a key market leader, PBA is advancing ultra-precision motion solutions for advanced packaging and smart manufacturing, while being committed to building a strong and robust ecosystem for Singapore's semiconductor landscape.

PBA Systems is an ISO certified company with expertise in Direct Drive Technology, and High Precision Stage Motion Solutions for Semiconductor and industry manufacturing. PBA Group own proprietary robotic automation technologies and headquartered in Singapore, with manufacturing or sales centers in Malaysia, Taiwan, Japan, Korea, Thailand, China, USA and Europe. PBA Systems are capable to provide customized, one stop from components to motors, modules, integrated systems support for their global customers and system partners.

Please visit ***https://www.pbasystems.com.sg/*** for more information about PBA news and products.

pba SYSTEMS

SHAPING THE NEXT-GEN SEMICONDUCTOR LANDSCAPE IN SINGAPORE WITH SIMULATION-DRIVEN INNOVATION

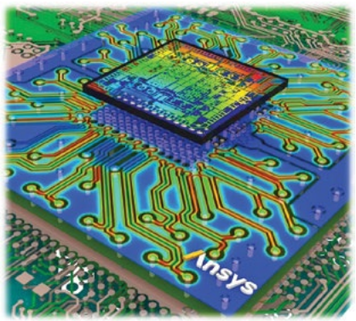
Dr. Ing Madhukar Chatiri, CEO, CADFEM APAC

Singapore is at a critical juncture in its journey to becoming a global semiconductor powerhouse. With a strong foundation in manufacturing excellence, a highly skilled workforce, and strategic government support, the nation is now focused on scaling advanced packaging technologies, deep-tech capabilities, and sustainability-led growth.

At the heart of this transformation is CADFEM. With a legacy spanning over 40 years, CADFEM began its journey in Germany in 1985 and has since grown into one of the world's leading providers of engineering simulation solutions. As a founding Ansys Channel Partner, CADFEM has been instrumental in advancing simulation and EDA technologies globally. Our presence across 30+ countries allows us to deliver deep domain expertise, proven methodologies, and global best practices to every engagement.

Today, CADFEM is proud to extend its legacy of simulation-driven innovation to Singapore, empowering the local semiconductor ecosystem with advanced technologies from Ansys, customized solutions, and an unwavering commitment to excellence from chip to system-level integration.

Accelerating Deep-Tech Innovation with Multiphysics Simulation



CADFEM, a trusted Ansys Elite Channel Partner, plays a vital role in helping Singapore's semiconductor ecosystem transition into a digitally engineered future. Our end-to-end simulation solutions empower local MNCs, SMEs, and startups to design, test, and validate advanced IC packaging, 2.5D/3D interposers, chiplets, and system-level architectures. Using Ansys HFSS, SIwave, Q3D Extractor, RedHawk-SC, and Sherlock, we enable first-time-right design with high accuracy and compliance with JEDEC, IEEE, and other global standards.

We support mission-critical semiconductor R&D by providing physics-based design optimization across electrical, thermal, and mechanical domains. From high-speed signal integrity to power integrity and thermal cycling fatigue, our multiphysics workflows shorten development cycles and increase the reliability of next-gen devices.

Scaling Simulation Capabilities Across SMEs and Startups

CADFEM actively helps emerging fabless companies and startups overcome resource constraints by offering access to simulation expertise, cloud-based HPC, and license flexibility. Our early-stage enablement programs include startup bundles with Ansys tools, onboarding sessions, and mentorship, ensuring smaller players can contribute meaningfully to Singapore's chip design ecosystem.

We also assist SMEs in adopting simulation-led design through proof-of-concept initiatives and pilot projects—demonstrating ROI and performance gains that build long-term simulation maturity.

Developing Local Talent for a Resilient Workforce

A strong semiconductor ecosystem thrives on skilled talent. CADFEM contributes to Singapore's talent pipeline by delivering industry-relevant simulation training in collaboration with local universities, research institutes, and semiconductor fabs. Our programs are tailored to build capabilities in chiplet-aware co-design, EMI/EMC compliance, and reliability analysis. By equipping the workforce with hands-on experience using Ansys Workbench and domain-specific tools, we help bridge the gap between academic learning and industry application.

Our initiatives also support Singapore's national focus on lifelong learning and skills upgrading, ensuring engineers stay ahead of fast-evolving technologies.

Driving Sustainable Innovation Through Digital Twins and AI/ML

With sustainability at the forefront, CADFEM promotes the adoption of Ansys Twin Builder and AI-integrated simulation workflows to minimize material waste, predict product failure, and optimize power usage. By developing digital twins of packaging systems and fabs, we help semiconductor companies make data-driven decisions to improve reliability and energy efficiency.

We further extend our capabilities with AI/ML-driven surrogate modeling, helping R&D teams accelerate design space exploration and predictive maintenance. These innovations directly align with Singapore's Smart Nation goals and its green electronics manufacturing agenda.

Fostering Collaboration Across Industry, Academia, and Government

CADFEM actively supports Singapore's vision of a collaborative semiconductor ecosystem. Through co-innovation projects, technical mentorship, and technology transfers, we connect academia, industry, and public sector stakeholders to achieve shared outcomes. We facilitate simulation-led innovation hubs, support government-backed prototyping initiatives, and help universities commercialize research through real-world application.

Our collaboration extends to public-private partnerships that address challenges in thermal design, electromagnetic compatibility, and multi-die reliability—key issues in Singapore's high-density packaging and heterogeneous integration roadmaps.

Commitment to a Future-Ready Ecosystem

As a long-term partner to Singapore's semiconductor journey, CADFEM along with Ansys is committed to enabling scalable growth and resilient innovation through simulation, education, and strategic collaboration. Our mission is clear: to help shape a smarter and globally competitive semiconductor ecosystem for Singapore. We believe in empowering the ecosystem from every angle—tools, training, and technology—and supporting its evolution with deep technical expertise and a global vision tailored to local impact.

Our Team

CADFEM

cadfem.ai

QINGDAO:

A RISING NEW LANDMARK IN CHINA'S INTEGRATED CIRCUIT INDUSTRY

As a strategic hub in Northeast Asia and the Pacific Rim Economic Circle, Qingdao is reshaping the global semiconductor industry landscape with its international innovation ecosystem and has successfully secured a spot among the world's top 100 cities for comprehensive competitiveness in the integrated circuit (IC) industry. Serving as the core hub for Qingdao's IC industry development, the Qingdao Integrated Circuit Industrial Park has rapidly emerged as a dynamic force in China's semiconductor sector, leveraging its superior geographical advantages and flexible, open policy framework. To date, the park has attracted over 50 upstream and downstream enterprises in the industrial chain, with cumulative investments exceeding 180 billion yuan.

Located within the China (Shandong) Pilot Free Trade Zone Qingdao Area,The first phase of Qingdao Integrated Circuit Industrial Park spans a planned area of 2700-mu. It features dedicated zones for electronic chemicals and a components distribution center, actively building a semiconductor supply chain hub that radiates across northern China and connects globally. The park is committed to fostering a comprehensive industrial chain ecosystem. Its infrastructure is well-equipped, boasting China-leading supporting facilities such as dual-source, dual-path water supply, triple-loop 220kV power lines, specialized wastewater treatment works for the electronics industry, and dedicated gas stations for industrial use.

Situated at the intersection of the Bohai Rim Economic Circle and the Northeast Asia economic belt, the park's location within the Free Trade Zone represents an upgraded version of China's reform and opening-up policy, making it one of the most open and economically vibrant regions in the country. Qingdao boasts a robust electronics information industry and abundant manufacturing application scenarios. The park has fostered an innovation-driven industrial environment in collaboration with local global manufacturing leaders such as Haier, Hisense, and Goertek, providing semiconductor companies with end-to-end support from design and manufacturing to terminal applications.

Looking ahead, the Qingdao Integrated Circuit Industrial Park will further capitalize on its superior location and flexible policy advantages. By 2030, it aims to establish itself as a pivotal IC industry cluster in China. Leveraging Qingdao Port's annual cargo throughput of over 700 million tons and container throughput exceeding 34 million TEUs, the park will accelerate the formation of a two-hour economic circle linking semiconductor industry clusters in Japan, South Korea, and Singapore. This effort will solidify its position as a globally competitive industrial ecosystem with a strong foundation for international cooperation.

Contact person:

Mr. Lv, *Head of the Working Team of Qingdao Integrated Circuit Industrial Park*
Mobile Number: **0086-13687653266**
Email: **zdgwjjfzb@sgep.cn**

青岛：

崛起中的中国集成电路产业新地标

青岛市作为东北亚与环太平洋经济圈的战略枢纽，正以国际化创新生态重塑全球半导体产业格局，并成功跻身全球集成电路产业综合竞争力百强城市。作为青岛市集成电路产业发展的核心承载区，青岛市集成电路产业园凭借优越的区位优势和开放灵活的政策体系，已迅速成为中国半导体产业发展的新锐力量。截至目前，产业园已吸引50余家产业链上下游企业入驻，累计投资额超1800亿元。

青岛市集成电路产业园位于中国（山东）自由贸易试验区青岛片区范围内，一期规划面积2700亩，规划建设了电子化学品专区和零部件物料集散中心，积极构建辐射中国北方、联动全球的半导体产业供应链枢纽，致力打造全产业链发展格局和生态体系。产业园基础配套设施完善，已建成中国领先的双水源双路径供水、三回路220kV供电线路、电子工业污水处理厂及特种气站等高标准、专业化配套设施。

青岛市集成电路产业园地处环渤海经济圈与东北亚经济带交汇核心，其所在的自贸试验区是中国改革开放的升级版本，也是中国当前对外开放程度最高、外向型经济最活跃的区域之一。青岛市电子信息产业发达，制造业应用场景丰富，产业园已与青岛市本地海尔、海信、歌尔等全球电子制造业龙头企业形成需求驱动创新的产业氛围，可为半导体企业提供从设计、制造到终端应用的全链条支持。

未来，青岛市集成电路产业园将进一步发挥优越的区位条件和开放灵活的政策优势，计划到2030年建设成为中国重要的集成电路产业集聚高地，并依托青岛港货物年吞吐量超7亿吨、集装箱吞吐量超3400万标箱的国际贸易物流优势，加速形成辐射日韩和新加坡半导体产业集群的2小时经济圈，全力塑造具有核心竞争力的国际合作产业生态。

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NOVALPQUARTZ:

A PRECISION PARTNER FOR THE SEMICONDUCTOR INDUSTRY

Could you share the origins of NovAlpQuartz and how the company has evolved since its founding?

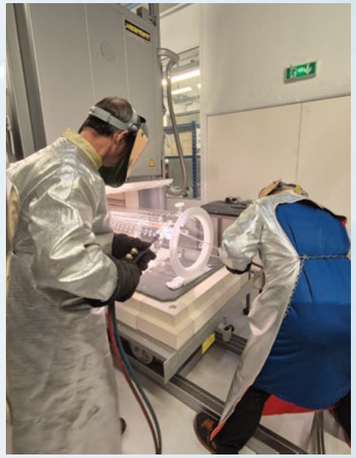
NovAlpQuartz was founded in June 2014 in the Savoie region of France by Eric Blanc and José Da Silva to meet the needs of key semiconductor players—such as STMicroelectronics, Soitec, and CEA—for high-quality, local cleaning services for quartz and SiC components. From the beginning, we focused on our core expertise: quartz glass blowing and the development of specialised cleaning baths. This rare and highly technical know-how has since expanded to support critical maintenance processes in the microelectronics sector.

We are widely recognised for our excellence in quartz blowing and welding, which positions us as a trusted innovation partner across a range of industries, including semiconductors, research, photovoltaics, luxury watchmaking, and defence. Our services are structured around two pillars: maintenance of spare parts—encompassing the cleaning and repair of quartz, SiC, graphite, ceramic, and silicon components—and the design and manufacture of quartz parts, from prototypes to small production runs. We also work closely with clients' R&D teams, contributing to the development of next-generation technologies and offering value-added services such as logistics, diagnostics, training, and consulting. Our team's synergy and commitment to performance continue to drive us forward.

What have been some of the key milestones in your journey so far?

Several milestones have shaped our journey. In 2014, we were named laureates of the Réseau Entreprendre Savoie, and in 2015 we moved into our dedicated facility in Saint-Hélène-du-Lac. That year also marked our first qualifications from major clients, including STMicroelectronics and Soitec. In 2016, we obtained ISO 9001 certification, reinforcing our commitment to quality.

Between 2016 and 2024, we diversified our client base into sectors such as research, photovoltaics, defence, and medical technology. In 2022, we expanded our facility with a cleanroom dedicated to treating specific and metallic contaminations (Cu, Al, B, P, etc.), significantly enhancing our cleaning capabilities. In 2023, we introduced a general management structure to support our European and international development and made our first business trip to Singapore, initiating our expansion into Asia. In 2025, we joined the Ultraclean Expertise Platform, further establishing ourselves as specialists in the cleaning of quartz, SiC, and silicon components.



How does NovAlpQuartz position itself within the semiconductor industry today, and what differentiates your expertise?

We are recognised as a leading expert in the cleaning and repair of quartz components in France and a key partner to clients such as Soitec and STMicroelectronics. Our approach is rooted in deep technical expertise and a continuous drive for innovation. Our team has in-depth knowledge of components used in a wide range of furnaces—ASM, TEL, KOKUSAI, CENTROTHERM, ECM, SEMCO, and TEMPRESS—allowing us to deliver highly tailored solutions.

Our strength lies in the combination of experienced senior technicians and a new generation of quartz blowers, ensuring excellence and continuity. We also co-develop parts with clients' R&D teams, and offer advanced cleaning services for quartz, SiC, silicon, graphite, and ceramic components, addressing both standard and complex contaminations. We specialise in the repair of large, intricate quartz parts, where precision and expertise are essential. Our clients value our responsiveness, professionalism, and consistently high quality of service.

Asia continues to play an increasingly vital role in the global semiconductor ecosystem — what opportunities do you see in the region?

Asia continues to play a growing and strategic role in the global semiconductor industry, and at NovAlpQuartz, we see strong potential for collaboration in the region. Our goal is to become a trusted partner to companies in Singapore and across Asia that specialise in the cleaning and repair of quartz components, bringing complementary expertise and know-how to support the local semiconductor ecosystem. As the cost of quartz rises and lead times for complex quartz parts become increasingly longer, we offer a valuable alternative, providing tailored cleaning and repair services designed to meet both operational and supply chain challenges.

How does your company contribute to the industry, particularly in addressing sustainability and supply chain challenges?

We are committed to supporting the semiconductor industry by promoting more sustainable and cost-effective practices, particularly in the face of growing supply chain challenges. Our approach focuses on extending the life cycle of quartz components through advanced repair solutions, helping our clients avoid the need to purchase new, often expensive and hard-to-source parts. We also prioritise the recycling of damaged or broken components, reducing waste and minimising environmental impact. By preserving and reusing a raw material that is becoming increasingly scarce and costly, we not only contribute to more sustainable production processes but also help strengthen supply chain resilience for our partners.

NOVALPQUARTZ Partner

Hélène PAULIAT
General Manager NovAlpQuartz
helene.pauliat@novalpquartz.com

TINY CHIPS, BIG PRECISION

Precision Engineering (PE) plays a foundational role in the semiconductor industry. It provides the technical base for producing accurate and reliable components used in semiconductor manufacturing equipment as well as operations. These components must meet extremely tight tolerances and performance standards to ensure consistent operation across high-volume production.

PE also plays a role in developing and producing specialised equipment used in semiconductor manufacturing. This includes machinery for chip handling, packaging, and testing; systems that must deliver stability and performance under demanding production conditions.

As chip designs become smaller and more complex, the strength of the PE sector remains an important enabler for continued progress.

Voice of the PE sector

As the leading trade association representing Singapore's Precision Engineering and Technology community, **SPETA** plays a strategic role in driving sectoral growth, collaboration, and reach.

Building Capabilities Through Partnerships - SPETA works closely with leading research institutes such as SIMTech and ARTC to strengthen the technical capabilities of our members. Through curated training and applied R&D collaborations, companies can adopt advanced manufacturing practices and prepare for future industry demands. In tandem, we support engineering talent attraction and development via government and industry-led initiatives.

Enabling Two-Way Industry Learning - We create platforms for cross-sector knowledge exchange between PE companies and industry leaders. For instance, SPETA organised a learning journey to Micron to learn about their sustainability journey and how they utilised new technologies to improve production efficiency.

Showcasing Singapore Capabilities on the Global Stage - SPETA also lead Singapore Pavilions and facilitate business matching at major global tradeshows. We help members pursue new growth opportunities while elevating Singapore's position as a trusted hub for precision engineering and advanced manufacturing.

Going far, Going Together

Industry associations such as SPETA and SSIA play a vital role in bringing together diverse stakeholders—including government agencies, educational institutions, and industry leaders to collectively strengthen Singapore's semiconductor ecosystem.

For example, **SPETA** and **SSIA** joined forces to support talent recruitment and retention efforts at the SSIA Electronics Industry Day, to build a pipeline of skilled professionals for the industry.

By tapping on each other's expertise, networks, and resources, SPETA and SSIA are well positioned to lead the charge in growing Singapore's semiconductor and precision engineering ecosystem, ensuring we go far and go together.

SPETA

PORVAIR FILTRATION GROUP IN THE MICROELECTRONICS AND SEMICONDUCTOR INDUSTRY

In the precision-focused world of semiconductors and microelectronics, maintaining ultra-clean environments is critical. Porvair Filtration Group supports this mission with advanced high-purity gas and liquid filtration solutions, tailored for OEMs, and equipment manufacturers.

With a focus on reducing operational costs and improving yield consistency, Porvair's filtration technologies are designed to enhance equipment uptime, extend chemical life, and minimize process defects in demanding manufacturing environments.

GasPro™: Engineered for Critical Gas Applications

The GasPro™ range ensures cleanliness and safety across a wide range of gas handling processes, including:

- Gas safety management
- Exhaust venting
- Flow control
- Needle valve replacement
- Flame arresting

Key products include GasPro™ High Purity Gas Filters, Flow Restrictors, and Gas Diffusers.

These components are built from robust materials like 316L stainless steel, nickel, or Hastelloy® C22, delivering service at temperatures up to 700°C (1290°F) and ensuring long-term resistance to corrosion and particle shedding. Their mechanical strength enables operation under extreme pressure differentials—ideal for severe gas environments.

LiquiPro™: High-Purity Chemical Filtration

Porvair's LiquiPro™ range delivers efficient chemical filtration for key semiconductor processes, including:

- CMP
- Wet etch and clean
- PVD copper plating
- DI water and final cleaning
- Acid, base, and solvent handling (selected applications)

Available in cartridge and capsule formats, LiquiPro™ products use advanced filter media such as PTFE, PES, PP, Nylon, and PVDF, designed to maximize filter life and process consistency.

A Trusted Partner in Purity

Porvair Filtration Group continues to lead with reliable, high-performance filtration systems engineered for modern semiconductor manufacturing.

Learn more at: *www.porvairfiltration.com*

Team

Jake Ayers
Business Development Manager – Microelectronics

Jake has been working in the filtration industry for just over 13 years with his time spent in technically biased roles. Jake has extensive knowledge leveraging PFG's broad technology to provide technically differentiated solutions to solve customer and industry problems. He is currently responsible for global microelectronics business and portfolio growth.

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Deepak Shetty
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Deepak is responsible for APAC enquiries, he has been working in the industry 18 years.

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porvair
filtration group

ANCHORED FOR GROWTH:

MKS INSTRUMENTS' SINGAPORE STORY

CapitaLand's high-specifications industrial building, Techview. Photo credit: CapitaLand

Global expansion is critical for companies wanting to stay competitive, and for MKS Instruments, expanding its presence in Asia is a key part of that strategy. This is the impetus behind the technology solution provider's growth plans in Singapore and the wider Asian region.

Breaking into a new market comes with its own set of challenges, from navigating unfamiliar business environments to understanding local customer needs. Strong partnerships have been key in helping the American-founded MKS Instruments drive success overseas and have played an important role in shaping its Singapore story.

From Massachusetts, USA to Singapore

Founded in Burlington, Massachusetts, United States of America (USA) in 1961, MKS Instruments is a global leader in providing technological solutions for leading-edge Semiconductor Manufacturing, Electronics and Packaging, and Speciality Industrial applications.

The company's foundational technologies are essential to the evolution of next-generation electronic devices. Today, over 85% of wafer fabrication equipment applications, as well as more than 70% of the critical steps to manufacture package substrates and printed circuit boards, rely on MKS' equipment.

In 1998, MKS Instruments expanded into Asia, setting up its Singapore office with a sales and service centre to support local customers and growing regional businesses. Almost three decades on, nearly all of MKS Instruments' Singapore-based operations are now housed in CapitaLand's Techview, a five-storey high-specifications industrial building specially designed for semiconductor assembly and testing operations.

Strategically Positioned for Success

Located in the bustling Kaki Bukit industrial area, MKS Instruments' home at Techview offers easy access to Mass Rapid Transit stations and major expressways such as the Pan-Island Expressway and Kallang-Paya Lebar Expressway. Its proximity to key facilities — including a third-party logistics warehouse and Changi International Airport — along with access to a highly skilled workforce and a range of amenities for associates, were key factors that attracted MKS Instruments to set up its Singapore operations there.

Since moving in, MKS Instruments has seen its growth in Singapore reach significant milestones over the past few years. In 2021, the company expanded its logistics warehouse to meet growing business needs, while an increase in licensed space requirements for its evolving laser manufacturing prompted even further growth in 2024. As MKS Instruments has grown its operations in Singapore, its home in Techview has expanded alongside them.

Not only is Techview large enough to house MKS Instruments' expanding operations under one roof, the property's efficient floor plate designs and strong infrastructure also allow for full space optimisation,

including the placement of heavy machinery and systems. The development has proven to be a flexible and scalable workspace, capable of supporting the company's continued growth.

A Shared Journey Towards Growth

Techview is one of the many prime industrial properties in CapitaLand's portfolio. Since facilitating MKS Instruments' move into the building, the Singapore property giant has become a trusted partner, supporting the company through the many stages of its growth journey by providing adaptable space solutions for their ever-evolving business needs.

As MKS Instruments continues to expand its presence in Singapore and across the Asian region, it is looking to collaborate with more industry leaders, particularly Singapore-based and local companies. In the same spirit of partnership, the company is also paying it forward, with plans to support small and medium-sized enterprises in developing new capabilities in box build and systems integration, an effort that aligns closely with the Singapore Economic Development Board's initiatives.

Looking towards the future, MKS Instruments plans to continue building on its unique position to capitalise on secular trends across the semiconductor and advanced manufacturing markets, based on the broadest portfolio of products and capabilities in this sector. These trends include an increased demand for advanced memory and logic chips, the growing importance of miniaturisation and complexity, and the accelerating need for laser-based precision manufacturing.

9 Serangoon North Avenue 5, a four-storey high-specifications industrial building. Photo credit: CapitaLand

Setting Your Roots with CapitaLand

Whether you're seeking a new workspace or expanding operations, CapitaLand offers businesses across several industry verticals, including those in the semiconductor industry, an extensive property portfolio to choose from. Some of these properties include:

· **30 Tampines Industrial Avenue 3,** a development primed for semiconductor activities, with a production area, ancillary office space, and an optimised layout for single-tenant occupancy.

· **9 Serangoon North Avenue 5,** suitable for businesses in electronics, information technology, and manufacturing activities; equipped with sizeable floor plates, high-power provision, and designed for single-tenant occupancy.

· **Corporation Place,** designed for businesses in light manufacturing and located within the Jurong Industrial Estate; equipped with large floor plates, multiple loading bays, and dock levellers.

Contact CapitaLand workspaces for more information: ***sg.marketing@capitaland.com***

POWERING INNOVATION:

AWS ACROSS THE SEMICONDUCTOR VALUE CHAIN

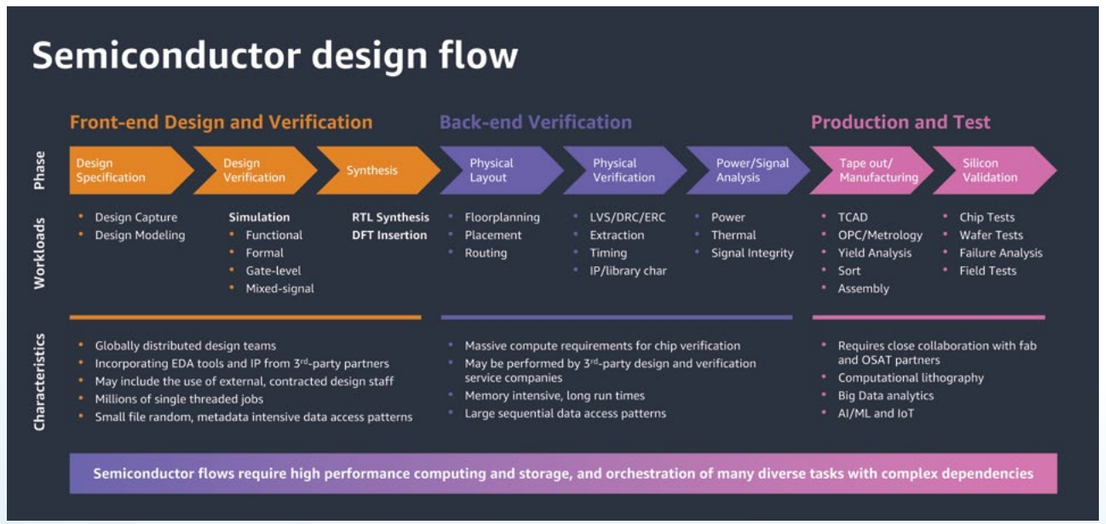
In today's rapidly evolving semiconductor landscape, cloud computing has emerged as a critical enabler for innovation and efficiency. Amazon Web Services (AWS) has positioned itself as an indispensable partner across the entire semiconductor value chain, offering tailored solutions that address industry-specific challenges from design to manufacturing to distribution.

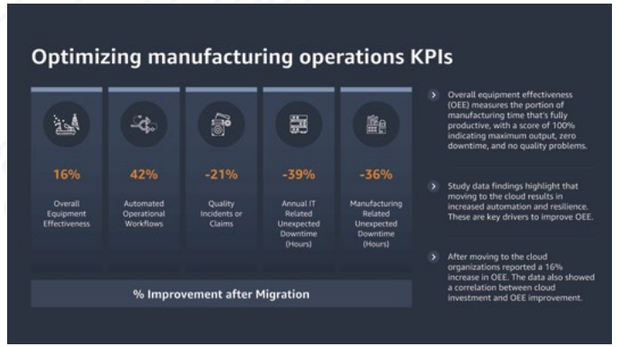
Accelerating Design & Development

Semiconductor design workflows demand massive computational power that fluctuates dramatically throughout development cycles. AWS's elastic compute resources enable companies to scale instantaneously for verification regressions, timing analysis, and power simulations—reducing what previously took weeks to mere hours.

AWS's electronic design automation (EDA) solutions provide high-performance computing environments optimized for chip design workloads, allowing designers to instantly access precisely the compute resources needed for specific tasks. Companies can select from various instance types to match exact memory, CPU, and storage requirements for each workflow phase.

The productivity gains are substantial — one example is Arm Ltd improving processing time by 50% and adding throughput of 66% for EDA workloads with AWS. This compression of development schedules allows for faster iterations and more thorough testing before tape-out, ultimately leading to higher quality chips reaching market sooner.





Transforming Semiconductor Manufacturing

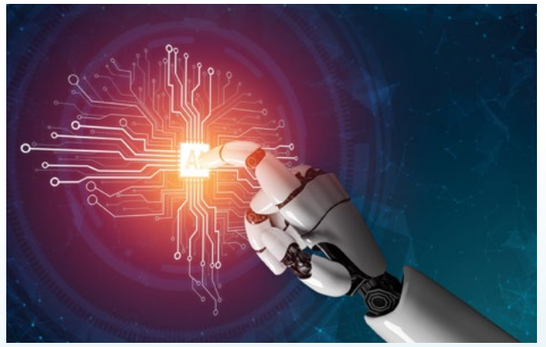
Amazon Web Services (AWS) is revolutionizing semiconductor fabrication through specialized cloud solutions addressing manufacturing's unique challenges. By providing vast computational resources, AWS enables advanced process simulation and real-time analytics that optimize production parameters at nanometer scale.

The platform supports AI and machine learning models that predict manufacturing defects, enhance yield rates, and optimize material usage—critical factors in an industry where microscopic precision determines profitability. AWS's IoT services transform factory operations by enabling comprehensive equipment monitoring across fabrication plants, supporting predictive maintenance that reduces costly downtime. The cloud infrastructure allows semiconductor manufacturers to implement digital twins of production lines, enabling virtual testing of process changes before physical implementation. As semiconductor manufacturing faces increasing complexity with smaller node sizes and advanced packing technologies, AWS's scalable computing resources, data analytics, and AI capabilities provide the technological foundation needed to help address yield challenges, maintain strict quality control, and efficiently manage the enormous data volumes generated during production. Case in point, GlobalFoundries has improved turn-around time of quality inspection by 240x, implemented predictive maintenance, and reduce time to market by 57%.

Generative AI: The next frontier

Generative AI on AWS is revolutionizing semiconductor operations across the entire value chain. Design teams can now access engineering guidance as AI analyzes technical specifications and suggests semiconductor layout optimizations, significantly reducing research time. Semiconductor companies managing complex Process Documentation Kits (PDKs) benefit from AI systems that instantly retrieve answers from thousands of documentation pages using advanced RAG techniques, achieving over 90% search accuracy. In manufacturing, AI accelerates defect analysis from weeks to hours—similar to how Jabil leveraged AWS's generative AI to improve operational efficiency by reducing data processing times by 74%, while achieving 23% cost savings and reducing deployment time >67%. On the factory floor, predictive maintenance powered by AWS's machine learning infrastructure reduces equipment downtime, while supply chain resilience improves through AI-driven insights and inventory optimization. By implementing these solutions on AWS's scalable infrastructure, semiconductor manufacturers can drive innovation and operational excellence throughout their production lifecycle.

Visit the AWS Hi-tech Electronics & Semiconductor solutions library to learn more and/or contact **Gautham Unni** (gauthamu@amazon.com), Head of Semiconductor Industry Solutions



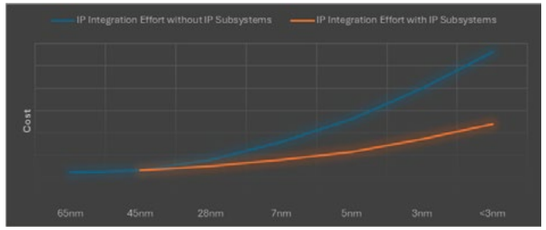
HANIC PTE LTD:

A HOLISTIC APPROACH FOR THE FUTURE OF COMPLEX IC DESIGNS

The slowing of Moore's Law has ushered in a new era of semiconductor innovation. As traditional transistor scaling approaches its physical limits, the industry is turning system scaling such as chiplet architectures and heterogeneous integration—combining smaller, specialized dies within a single package to sustain performance growth, reduce costs, and enhance design flexibility.

Hanic Pte Ltd, headquartered in Singapore, is at the forefront of this shift. Founded by semiconductor veterans from AMD and STMicroelectronics, Hanic delivers end-to-end solutions in IC design, advanced packaging, supported by our proprietary intellectual properties (IPs) portfolio. The company addresses the growing complexity of system-on-chip (SoC) designs through a modular, pre-verified approach that shortens design cycles and lowers cost.

Hanic maintains an extensive portfolio of silicon-proven IPs, including high-speed interfaces (PCIe, SerDes, USB), memory subsystems (DDR, LPDDR, HBM), analog front-ends, and customizable processor cores. These IPs are rigorously validated for industry compliance and can be licensed or customized, enabling customers to accelerate development without reinventing core components.



To further streamline innovation, Hanic offers turnkey IC design services using pre-integrated IPs and chiplets. This significantly reduces integration risk and time-to-market—particularly valuable for AI, data center, telecom, and automotive applications.

Recognizing that performance gains now increasingly rely on advanced packaging, Hanic also leads in advanced packaging solutions such as 2.5D/3D integration, fan-out wafer-level packaging (FOWLP), and through-silicon vias (TSVs). These technologies allow for efficient die stacking, enhanced bandwidth, and superior thermal performance.

Backed by strategic partnerships with other design houses, foundries and OSATs, Hanic offers a true concept-to-production flow. Their holistic approach—spanning architecture, IP, design, and packaging—makes them a trusted partner for companies aiming to scale quickly and effectively.

In a world where nanometers and nanoseconds define competitive advantage, Hanic provides the tools and expertise to drive next-generation semiconductor breakthroughs.

ASIC one-stop design service

Cover 28nm-5nm processes, including spec-in and netlist-in. Application areas includes High performance computing, heterogeneous AI, 5G and network, automotive ICs, etc.

Chiplet heterogeneous integration

Chiplet design and customization, one-stop advanced packaging design, production and test services, including MCM (up to 65*65 FCBGA), 2.5D, 3D

IP licensing

28nm-5nm hard IP customizations, licensing, integration, including high speed data interfaces, memory interface, chiplet, high-speed ADC, eFPGA, etc.

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