SSIA
Singapore Semiconductor Industry Association

SINGAPORE SEMICONDUCTOR VOICE

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SSIA's Momentum in 2024:

Reflecting on Growth and Driving Innovation into 2025

Semiconductor Awareness Days 2024:

A Massive Success! An astounding show of industry unity across 8 IHLs across Singapore brought together top industry leaders, passionate educators, and aspiring students. A powerful step towards building a future-ready workforce!

Driving Semiconductor Transformation through the Workforce Transformation Awards 2024:

In collaboration with Workforce Singapore, we proudly honour our Company and Individual Winners - read their exclusive interviews, inside!

Empowering Future Innovators:

Micron Chip Camp returned for a second successful year, fostering STEM enthusiasm among female students and breaking down barriers in tech, paving the way for a more inclusive, diverse, and inspired generation of female innovators in semiconductor technology.

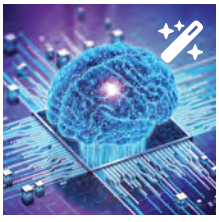
Joining the Singapore Semiconductor Industry Association (SSIA) opens a world of business opportunities

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.

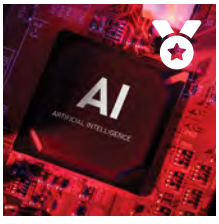


Branding and Marketing Leverage:

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

MPITEK

FluidTal

FT-Singapore

Orientalmotor

ZEBRA

FOREWORD

BY THE EXECUTIVE DIRECTOR

As we near the close of another year, I'm struck by how swiftly time has flown, a testament to the incredible pace of transformation in our industry. Each passing month has carried us through challenges and achievements alike, marking a year filled with resilience and progress. It's been a journey of persistence for all of us, navigating a slower-than-anticipated chip demand recovery that, paradoxically, has provided fertile ground for partnerships and growth. This period has allowed companies to deepen their collaboration with SSIA, fortifying the pillars that sustain our ecosystem—whether it's attracting and nurturing talent or strengthening supply chain networks to safeguard our industry's future.

Reflecting on the milestones of this year, I'm immensely proud of what we have accomplished together. Our student outreach efforts have reached unprecedented heights. Electronics Industry Day in January set the stage, achieving record participation not only from students but also from a greater number of companies, including SMEs stepping forward to engage the next generation. Building on this momentum, we launched a full-scale version of Semiconductor Awareness Day across all polytechnics and universities, probably creating one of Singapore's largest student outreach initiatives by a particular sector. Together with Electronics Industry Day, we have established a robust foundation to inspire and guide young minds—a beginning that only promises more impact in the years to come.

Throughout 2024, our collaboration platforms continued to expand in both scale and impact. The Women's Forum in March and Business Connect in July saw increased participation, underscoring our industry's commitment to diversity and growth. The SSIA Summit in September was our largest to date, driven by an engaging theme focused on AI and Quantum Technologies and supported by participation from companies, partners, and government representatives from across the globe. This event has now evolved into a truly international platform. Additionally, we marked the 10th run of our Singapore Semiconductor Leadership Accelerator (SSLA) programme and launched our first in-person Leadership in Engineering course for emerging leaders. The overwhelming demand for these leadership courses highlights our industry's dedication to cultivating leadership at every level, securing a strong future for our sector.

Looking ahead to 2025, our focus on workforce growth and development remains steadfast. I'm thrilled to share SSIA's recent partnership with Mentoring SG, a collaboration that aims to create not just a pipeline of talent, but a nurturing, mentoring culture across our industry. This initiative is essential to cultivating an environment where professionals feel valued and guided, fostering a cohesive, caring workforce that will carry our industry forward.

Next year also promises exciting visibility for Singapore as a global semiconductor hub, with the return of the Asia Photonics EXPO in February and SEMICON SEA in May. These international events offer a unique opportunity to showcase Singapore's exceptional talent pool, robust ecosystem, and commitment to sustainability to a global audience. As we prepare to welcome the world, let's highlight the unique strengths that make Singapore both a leader and a hub in the semiconductor industry.

While activities here in Singapore are set to increase, SSIA, along with our local and international partners, will also focus on helping local companies venture abroad. As global demand and opportunities grow, expanding overseas is vital for our businesses to stay competitive and resilient. I encourage you to stay tuned for more on this front in the coming months as we work together to support international ambitions for our local enterprises.

In the coming year, SSIA remains committed to our four flagship events, which, as always, are set to grow—engaging more participants and fostering even greater collaboration. I invite all companies to stand united in supporting our industry's continued growth. Many have already committed to next year's platforms, such as the Summit and Semiconductor Dinner, and I encourage each of you to join us in presenting a united Singapore semiconductor front to the world.

Let us move forward together, united in purpose, with unwavering commitment to a stronger future for our industry.

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

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UPCOMING EVENTS

Mark Your Calendars

SSIA
Singapore Semiconductor Industry Association

21 JAN 2025

Electronics Industry Day

The annual Electronics Industry Day is Singapore's largest student outreach event for the semiconductor sector, with major companies uniting to inspire and educate the next generation. This year, as we host it at ITE College Central again, even more companies and Institutes of Higher Learning are joining, along with secondary schools and junior colleges through our partnership with MOE. This collective effort highlights the industry's commitment to shaping its future.

https://ssia.org.sg/electronics-industry-day-2025/

12 MAR 2025

Semiconductor Women's Forum

The Semiconductor Women's Forum is a platform empowering woman in the semiconductor industry. Aligned with International Women's Day 2024, it celebrates progress in diversity and inclusivity, while focusing on job redesign and upskilling for mid-career women. By supporting their growth, the forum strengthens a resilient workforce ready to lead through innovation.

https://ssia.org.sg/semiconductor-womens-forum-2/

10 JUL 2025

Semiconductor Business Connect

Semiconductor Business Connect is a conference for MNCs and SMEs to unite as a collaborative powerhouse. Our goal: elevate SMEs through shared knowledge and networks, showcasing their innovations and emphasizing their essential role in driving the sector's global competitiveness and resilience. Together, we forge a path toward a unified and thriving semiconductor future.

https://ssia.org.sg/semiconductor-business-connect/

Leadership in Engineering

Back by popular demand! This three-day, in-person immersive workshop, led by Lead Coach Dominic Siow, offers a dynamic and highly interactive experience. It blends contemporary best practices from leadership, neuroscience, and high performance. Designed to empower industry professionals, the workshop sharpens leadership mindsets, emotional intelligence, and provides practical tools to drive impactful change. Beyond the learning, it also presents a unique opportunity to network and collaborate with professionals across the entire value chain, fostering valuable connections.

https://ssia.org.sg/leadership-in-engineering/

SSIA Summit and Semiconductor Dinner 2025

The Summit serves as a platform for sharing insights, discussing current trends, and charting the course for the technological integrations that will shape our future. It's not just another conference; it's the convergence of the brightest minds and most influential industry leaders in the semiconductor sector.

The Semiconductor Dinner offers a relaxed and celebratory atmosphere featuring the who's who of the industry – where participants can network, forge deeper connections, and celebrate the industry's achievements. This year, the Semiconductor Dinner will feature a special segment for the Workforce Transformation Award (WTA) presented by WSG, recognizing outstanding contributions to workforce development within the industry.

https://ssia.org.sg/ssia-summit-semiconductor-dinner/

These event dates are subject to change. Please stay updated by visiting our website or following us on LinkedIn @SSIA for the latest news on these exciting events!

SSIA SUMMIT 2024

SYNERGIZING SILICON:

PIONEERING THE FUTURE WITH AI AND QUANTUM TECHNOLOGIES

Held at Resorts World Sentosa on September 18, the SSIA Summit 2024 brought together the semiconductor industry's brightest leaders and innovators for a day of insightful discussions, showcasing the critical role of semiconductors in advancing AI and Quantum technologies. This flagship event, a cornerstone of the industry's annual calendar, highlighted the latest breakthroughs and set the stage for the future of technology.

As Singapore's first comprehensive summit on AI and Quantum Tech, the event featured 11 sessions led by industry leaders, each emphasizing how these technologies are transforming the semiconductor landscape.

OPENING SPEECH

Mr. Ang Wee Seng, SSIA's Executive Director, opened the summit with a powerful message of unity and collaboration. He urged the industry to "connect the dots" and unlock the full potential of AI and Quantum technologies through semiconductors. He emphasized that these advancements are not just technical; they represent an opportunity to elevate Singapore's position as a global hub for sustainable innovation and excellence.

KEYNOTE SPEAKER

Catherine West MP, the UK's Parliamentary Under- Secretary of State for the Indo-Pacific, followed with a keynote on the importance of global cooperation in technological development. Minister West underscored the UK's commitment to transforming research expertise into industrial success and highlighted the ethical responsibility that comes with technological advancement. This message resonated strongly, emphasizing that collaborative innovation between nations will drive global progress in AI and Quantum tech.

SPEAKERS

Ling Keok Tong, Executive Director of the National Quantum Office, kickstarted the event by presenting Singapore's National Quantum Strategy. He detailed the nation's strategic priorities in quantum research, illustrating how semiconductors are critical to scaling quantum innovations. His session set the tone for the day, aligning the summit with Singapore's national objectives in tech leadership.

Rafal Janik, COO of Xanadu Quantum Computing, took attendees on a journey through the challenges and opportunities of achieving fault-tolerant quantum computing. His insights into how quantum computing can revolutionize semiconductors offered a glimpse of the future, where quantum breakthroughs will reshape how we understand computational limits.

Professor Graham Reed, Director of the Optoelectronics Research Centre and Professor of Silicon Photonics at the University of Southampton, UK, introduced this cutting-edge field as the next frontier for the industry. He highlighted how silicon photonics is poised to become the backbone for AI circuits and quantum technologies, positioning it as a key technology for future semiconductor advancements.

SPEAKERS

Speaker
Laurence Liew - AI SG

Laurence Liew from AI Singapore tied everything together by offering companies practical strategies to ride the AI wave. He emphasized that businesses need to embrace AI now, not just as a technology but as a competitive edge to stay relevant in an increasingly AI-driven world.

Panel Discussion
Frost & Sullivan

A key panel moderated by Frost & Sullivan brought together morning speakers to explore the intersection of AI and Quantum technologies with semiconductors. The session emphasized that quantum computing's transformative power will depend heavily on advancements in semiconductors, while semiconductor innovations will accelerate quantum computing's path to commercialization. These synergies form the backbone of the industry's future.

Speaker
Professor Steven Wong - SIT

Professor Steven Wong, Director of SIT's Centre for Digital Enablement, tackled the role of Generative AI in education, illustrating how AI is transforming both the education system and the semiconductor industry. He offered a forward-thinking vision of how AI will reshape teaching, learning, and workforce training in the years to come.

SPEAKERS

Dr. Edna Chan, Centre Director of the Data Science and Analytics Centre (DSAC), Singapore Polytechnic shared insights on how industry-academia collaboration is essential for preparing a future-ready workforce. Her focus on talent development highlighted that human capital is just as important as technological advancement in shaping the future of the semiconductor sector.

Sreekanth Menon, Global AI Lead at Genpact, showcased how AI can be integrated across the semiconductor value chain—from optimizing supply chains to innovating chip design. His real-world case studies demonstrated how AI is already driving transformative change in the industry.

Angela Yeh, Senior Director at Realtek, discussed how AI is revolutionizing product design by streamlining processes, increasing efficiency, and aligning products more closely with consumer needs. Her presentation showed that AI is not just about innovation—it's about accelerating time-to-market and reducing costs.

SPEAKERS

Don Ong, Head of Innovation at Advantest, delved into smart factory automation by sharing how Big Data, AI/ML advancements, and human-robot collaboration are shaping the future of semiconductor manufacturing. His session emphasized the need for customized solutions in a rapidly evolving industry.

Ramon Sagarna, Principal Data Scientist at Lam Research, closed with a deep dive into AI-driven tools for semiconductor manufacturing. His presentation on machine learning, adaptive equipment, and smart metrology showed how these technologies can streamline operations, improve accuracy, and fuel further innovation in the sector.

Anuj Mahendru, Global Director Semiconductor & Hi-Tech Industry at Rockwell Automation, rounded out the day with a discussion on how AI and ML can help solve the industry's sustainability challenges. From cleanroom monitoring to real-time corrective actions, his insights demonstrated how AI can make fabs more efficient and environmentally responsible.

As we wrapped up the SSIA Summit 2024, one thing became clear:

AI AND QUANTUM TECHNOLOGIES ARE NO LONGER ON THE HORIZON—THEY ARE HERE, AND THEY ARE RESHAPING THE SEMICONDUCTOR INDUSTRY.

MP Catherine West and SSIA Executive Director Wee Seng

Throughout the day, leaders from across the globe shared their vision of the future, offering a comprehensive look at how these technologies will drive innovation in every aspect of our sector. As we move forward, it's crucial that we embrace these transformations and work together to lead the world in semiconductor excellence.

Watch SSIA Summit 2024 Highlights

SEMICONDUCTOR
DINNER 2024
SSIA

SEMICONDUCTOR DINNER 2024
18th September 2024 | Wednesday

SEMICONDUCTOR DINNER 2024
GUEST-OF-HONOUR : MR. DESMOND TAN

SEMICONDUCTOR DINNER 2024
GUEST-OF-HONOUR : MR. DESMOND TAN
Senior Minister of State, Prime Minister's Office
and Deputy Secretary-General, NTUC

SEMICONDUCTOR DINNER 2024
GUEST-OF-HONOUR : MR. DESMOND TAN
Senior Minister of State, Prime Minister's Office
and Deputy Secretary-General, NTUC

AI

Following the Summit, the Semiconductor Dinner provided a relaxed and celebratory atmosphere for industry leaders to network and celebrate achievements. With increasing attendance and sponsorship each year, the SSIA Dinner has become a cornerstone of the semiconductor industry in Singapore and the region.

The 2024 Semiconductor Dinner featured the inaugural Workforce Transformation Award (WTA), presented by Workforce Singapore (WSG), to recognize outstanding contributions to workforce development within the industry. We also announced the winners of the Charity Art Auction organized by Shaping Hearts, an initiative of NECDC, adding a meaningful philanthropic dimension to the evening.

Held on 18 September, the largest Semiconductor Dinner to date marked a significant milestone with the launch of the Workforce Transformation Awards. Guest of Honour Mr. Desmond Tan, along with Ms. Dilys Boey, Chief Executive of WSG, honored the evening's awardees.

As the semiconductor sector, like the broader electronics industry, undergoes rapid transformation driven by digitalization and Industry 4.0, the demand for workforce upskilling and reskilling has intensified. WSG has been at the forefront of this transformation, implementing initiatives like the Career Conversion Programme (CCP) in partnership with key players, including SSIA, to equip Singapore's talent with future-ready skills.

The Workforce Transformation Awards symbolize the successful collaboration between government agencies, industry associations, and innovative companies, all committed to developing a resilient, future-ready workforce for Singapore.

DRIVING SEMICONDUCTOR TRANSFORMATION

Workforce Transformation Awards (WTA)

Brought to you in collaboration with Workforce Singapore

In recent years, the electronics industry, especially the semiconductor sector, has undergone rapid transformation spurred by technological advancements, digitalization, and the emergence of Industry 4.0. These changes have heightened the demand for workforce upskilling and reskilling to meet the industry's evolving needs.

Workforce Singapore, as the national agency driving workforce development, has recognized this pivotal moment and led efforts to drive transformation across various industries. Through initiatives like the Career Conversion Programme (CCP) and strategic partnerships with key industry players, including SSIA, WSG has played an instrumental role in equipping Singapore's talent with the future-ready skills needed to succeed in a dynamic job landscape.

The Workforce Transformation Awards embodies the collaborative spirit between government agencies, industry associations, and visionary companies, all committed to building a resilient, future-ready workforce for Singapore.

Group Photo of the WTA Company and Individual Winners,
presented onstage by Guest-of-Honour Mr. Desmond Tan, Senior Minister of State, Prime. Minister's Office and Deputy Secretary-General, NTUC; and Ms. Dilys Boey, Chief Executive of Workforce Singapore (WSG).

Industry

Jennifer Teong
SSIA Chairman
Manufacturing &
Quality Vice President,
Silicon Labs International

SILICON LABS

Industry Recognition Award:
Electronics Industry

The first award, the Industry Recognition Award, was presented to the entire electronics industry in appreciation of its collective commitment to workforce transformation and development. This award celebrates the industry's inspiring dedication to adapting to change and shaping the future of both electronics and the semiconductor sectors. Ms. Jennifer Teong, Chairperson of SSIA, graciously accepted the award on behalf of the industry.

DRIVING WORKFORCE TRANSFORMATION:

MICRON'S COMMITMENT TO A FUTURE-READY SEMICONDUCTOR INDUSTRY

Individual

A Conversation with Chen Kok Sing, Corporate Vice President and Singapore Country Manager, "Micron Technology

Chen Kok Sing, Corporate Vice President and Singapore Country Manager at Micron Technology, is recognised for his outstanding leadership in driving workforce transformation.

His commitment to inclusivity has led to women comprising 40% of Micron Singapore's workforce, whilst his vision for continuous learning has established Micron as a leading employer for fresh graduates in Singapore's semiconductor industry.

Kok Sing's holistic approach to leadership extends beyond the workplace, fostering community engagement with over 60,000 volunteering hours clocked by Micron's Singapore 9,000+ team members in 2023 alone.

*Read the **Full Interview** here:*

Chen Kok Sing
Corporate Vice President and
Singapore Country Manager,
Micron Technology

Q: How does receiving this award reflect your company's commitment to workforce transformation within the semiconductor industry, particularly in the Singaporean context?

Receiving this award is a big moment for us at Micron, it is a real testament to our dedication to building a future-ready workforce right here in Singapore's booming semiconductor industry. We have fully embraced the push toward Industry 4.0, continuously upskilling our team members and investing in the latest manufacturing technologies to stay ahead of the curve. Being recognized for these efforts reinforces our commitment to shaping a skilled talent pipeline and supporting Singapore's position as a global hub for semiconductor innovation.

Q: Which specific initiatives or strategies have been particularly impactful in the semiconductor sector and contributed to receiving this award?

At Micron, we embrace a growth mindset and lifelong learning through our comprehensive training and development programs. As we drive technical development through AI, IoT, and automation advancements, our philosophy is also to ensure no one is left behind.

The launch of Micron's first Remote Operations Center in Singapore exemplifies this philosophy. When we expanded our operations and cleanroom spaces, it became impractical to rely solely on manual operators. The Remote Operations Center allows team members to monitor the process and equipment status and take actions remotely. This led to upskilling hundreds of operators into process and equipment technicians performing more complex and higher value-added jobs. This initiative demonstrated our commitment to inclusivity and continuous improvement.

Q: How do you view SSIA's role in driving unity and transformation within the semiconductor sector as we approach 2025 and beyond?

We appreciate SSIA's efforts in facilitating ecosystem partnerships, knowledge sharing and talent development. All of these are crucial for our industry's continued growth and competitiveness as we move toward 2025 and beyond. SSIA's platform empowers companies like Micron to both contribute to and benefit from collective efforts in workforce transformation.

Through SSIA, we can collaborate on industry standards, share our best practices, and drive the overall growth and resilience of the semiconductor sector. Together, we can contribute to a thriving semiconductor industry in Singapore.

Q: What message would you like to share with other industry professionals regarding the importance of workforce transformation in the semiconductor sector?

In today's fast-paced semiconductor industry, workforce transformation is not just an option, it is a necessity. As we adopt new technologies, investing in our people becomes critical to securing future growth. By emphasizing reskilling and upskilling, we create a workforce that is not only skilled but also fosters a culture of innovation and flexibility.

When we commit to developing our talent, we strengthen our industry's competitiveness and resilience, ensuring we are ready to adapt to the challenges ahead. By working together, we are not just driving change; we are building a vibrant semiconductor industry in Singapore that's poised for the future.

DRIVING WORKFORCE TRANSFORMATION:

ST'S COMMITMENT TO A FUTURE-READY SEMICONDUCTOR INDUSTRY

Individual

A Conversation with Foo Kuo Yang, Senior Human Resources Director at STMicroelectronics Singapore

Read the ***Full Interview*** *here:*

Foo Kuo Yang, Senior Human Resources Director at STMicroelectronics Singapore, is honoured for his significant contributions to workforce transformation in the semiconductor industry.

As a key advocate, Kuo Yang played a pivotal role in shaping industry-relevant curriculum for ITE's Microelectronics and driving successful Work-Study programmes across ITE and SIT, making STMicroelectronics one of the largest private sponsors for these initiatives.

Kuo Yang's efforts have also driven the upskilling of many PMETs and operators who have been transitioned into technician roles. Under his leadership, many hires have joined STMicroelectronics through the Career Conversion Programme (CCP), further reinforcing the company's commitment to workforce development. Kuo Yang has also contributed to industry thought leadership through his participation in SSIA's roundtables and events.

Foo Kuo Yang
Senior Human Resources Director at STMicroelectronics Singapore

Q: How does receiving this award reflect your company's commitment to workforce transformation within the semiconductor industry, particularly in the Singaporean context?

We're not just preparing for a future-ready workforce—we're creating a holistic and immersive approach for the development of the future workforce. Additionally, we have an emphasis to provide viable opportunities for those preferring an applied learning approach and the "road less travelled".

This award is really the result of the collective contribution of our team in STMicroelectronics. It demonstrates the value of STMicroelectronics' belief and commitment to future-proofing our workforce in Singapore. The differentiated approach STMicroelectronics has taken in transforming our current and future workforce can be a "proof-of-concept" reference for the rest of the semiconductor industry. It is crucial that our workforce transformation is addressed holistically as an industry.

Q: Which specific initiatives or strategies have been particularly impactful in the semiconductor sector and contributed to receiving this award?

STMicroelectronics strongly subscribes to the pedagogy of applied learning and embedding real-world work into the development of our workforce. Through such integration, we can equip our future workforce with first-hand work experience, technical know-how, and necessary soft skills in the workplace, such as critical thinking, communication, and collaboration skills. We are very glad that our integrated learning environment and strong partnerships with SIT, SgIS and ITE have helped our interns/trainees develop themselves during their stint to become a ready workforce for our company and the industry. In return, our interns have injected a sort of "reverse mentoring" by sharing the latest (and future) trends and knowledge in areas such as AI, as well as innovative prototype solutions with our existing workforce. These complement our transformation efforts and foster an environment of cross-learning and appreciation for a diversity of experience and skills.

STMicroelectronics strongly believes in the applied learning and "reverse mentoring" approach. Through this approach, we foster an environment where our interns bring their unique expertise to the table, such as AI-empowered solutions, cross-learning and discussion sessions with our existing employees. Through these interactions, many innovative and relevant solutions were developed to serve our business needs.

Reverse mentoring need not always happen in a formal setting, as much knowledge can be gained informally through daily engagements. This is "ST teaches ST", where the learning never stops.

Our work-study programs have been a key pillar of our workforce initiative. The key to the success with the programs is that ST onboards the interns and trainees as if they are actual employees and equips them with essential technical and soft skills through the experience of working alongside real-world employees. The work-study interns and trainees are put through the same training as our employees and are involved in real daily jobs to gain hands-on experience. Through this integration between our employees and our interns/trainees, our company developed the learning agility for both our employees and our interns/trainees, where our employees benefit from the new knowledge and creativity that our interns/trainees bring, and our interns/trainees apply their knowledge and creativity in real-world applications with the guidance of our employees. This mutual "collaboration" creates the future-ready workforce for our company and our industry.

Q: How do you view SSIA's role in driving unity and transformation within the semiconductor sector as we approach 2025 and beyond?

SSIA is central to our semiconductor industry. With the strong and sustainable partnerships built across the ecosystem, SSIA is well-positioned to connect the dots between agencies, learning institutions and companies to recommend and/or drive industry level initiatives.

A few key successes are the Electronics Industry Day which has evolved tremendously over the last couple of years to become a trademark event for our semiconductor industry, Semiconductor Awareness Day, SAY Ambassadors and IC Design Camp which continue to bring the awareness and appreciation of our industry to the doorsteps of our future generations, Semiconductor Women's Forum to showcase the diversity and inclusion of our industry and progressively demolish the gender bias in our industry.

DRIVING WORKFORCE TRANSFORMATION:

asm OSRAM's COMMITMENT TO A FUTURE-READY SEMICONDUCTOR INDUSTRY

Individual & Company

A Conversation with Valerie Lee Senior Human Resources Director, Regional Asia, ams-OSRAM, and Mr. Xu Yi, General Manager and Vice President of CSA Operations, who received the company award on behalf of amsOSRAM.

Valerie Lee
Senior Human Resources Director, Regional Asia, ams-OSRAM

Valerie Lee, Senior Human Resources Director, Regional Asia at ams-OSRAM, is recognised for her exceptional leadership in workforce transformation. Despite financial constraints in 2023, Valerie secured training grants and annual increments for affected employees, turning challenges into opportunities for growth.

Her proactive approach to employee development, particularly in AI and emerging technologies, has been pivotal in ams-OSRAM's shift toward becoming a smart factory.

Beyond her company, Valerie inspired her HR team and contributed to the Mountbatten community through the Career Supervisory Programme, reflecting her deep commitment to learning and outreach. Her outstanding contributions have earned her multiple accolades, including being a finalist for Best HR Leader at HR Tech Festival Asia 2024 and receiving the Global Exceptional Women Award. Valerie's leadership, recognised by the Harvard Business Review and Workforce Singapore, continues to shape workforce transformation in Singapore.

Q: What does the Workforce Transformation Award (WTA) mean to you personally, and how do you see it influencing your future contributions to the semiconductor industry?

Valerie: The Workforce Transformation Award (WTA) holds immense personal significance for me. It's not just a recognition of our efforts at ams OSRAM Singapore, but also a testament to the collective commitment of our team to innovate and adapt in a rapidly evolving industry. Personally, it reinforces my belief in the importance of prioritizing people in our transformation efforts.

Looking ahead, I see this award influencing my contributions to the semiconductor industry in several ways. Firstly, it motivates me to continue advocating for initiatives that foster talent development and employee well-being. As we navigate the challenges of a dynamic market, I believe that investing in our workforce is key to sustaining innovation and competitiveness.

Additionally, the WTA inspires me to share best practices and collaborate with other leaders in the industry. By fostering a culture of knowledge sharing, we can collectively elevate the semiconductor sector and ensure we're equipped for future challenges. Ultimately, I aim to leverage this recognition to drive meaningful change that benefits both our employees and the broader industry landscape.

*Read the **Full Interview** here:*

Mr. Xu Yi
General Manager and
Vice President of CSA
Operations, ams-OSRAM

Q: How has your company adapted its workforce development strategies to align with both local and global trends in the semiconductor sector? Do provide examples of how your workforce initiatives have made your organization more agile and future-ready, especially in Singapore's competitive landscape?

ams-OSRAM has set a new benchmark in the electronics industry through strategic initiatives in emerging technologies, substantial investments in employee training, and a comprehensive digital transformation programme.

They have empowered numerous employees with digital competencies through their Career Conversion Programme, positioning themselves as a leader in smart manufacturing. Their commitment to workforce development is further exemplified by their successful implementation of Industry 4.0 and Worker 4.0 solutions across multiple workstreams, fostering a culture of continuous learning and innovation that prepares their workforce for the challenges of tomorrow.

Xu Yi: At ams OSRAM Singapore, we've made significant strides in adapting our workforce development strategies to align with the rapid pace of technological advancement and the shifting demands of the industry by focusing on several key areas.

Firstly, we have made significant investments in training our employees in emerging technologies, including Artificial Intelligence (AI), Machine Learning and Robotic Process Automation (RPA). These initiatives are designed to keep our workforce at the forefront of industry advancements, ensuring they can effectively utilize new tools and systems to enhance productivity and optimize operations.

Secondly, we implemented reskilling and job redesign programs, enabling our employees to adapt to the rapidly evolving landscape of Industry 4.0 by acquiring the skills and competencies needed to seamlessly transition into modified or expanded roles within the company.

We have embarked on a transformative journey, driving a company-wide digital revolution by implementing Industry 4.0 and Worker 4.0 solutions across our operations, equipping our employees with crucial digital competencies. This transformative initiative has not only positioned our workforce at the cutting edge of technological advancement but has also accelerated our evolution into a smart factory.

Additionally, we keep a close eye on global trends, such as the increasing emphasis on sustainability and digital transformation. Our workforce development initiatives include training on sustainable practices and digital tools, ensuring our team is equipped to lead in these areas.

Lastly, we prioritize diversity and inclusion, recognizing that a varied workforce fosters creativity and innovation. By creating an inclusive environment, we attract diverse talent that brings unique perspectives to our projects.

Through these strategies, we're not just adapting to trends; we're positioning ourselves as a leader in the semiconductor industry, ready to meet the challenges of tomorrow.

Q: What message would you like to share with other industry professionals regarding the importance of workforce transformation in the semiconductor sector?

Valerie: & Xu Yi: Workforce transformation is not just an option; it's a necessity for the semiconductor sector to thrive in today's fast-paced and ever-evolving landscape. As we face increasing competition and rapid technological advancements, investing in our workforce is crucial for sustaining innovation and driving growth.

Emphasizing continuous learning and development creates a culture of adaptability, enabling employees to stay ahead of industry changes. Additionally, fostering collaboration across teams enhances creativity and problem-solving, which are essential for addressing complex challenges.

Moreover, prioritizing employee well-being ensures a motivated and resilient workforce. When employees feel supported, they are more engaged and productive, which directly impacts the company's success.

Ultimately, embracing workforce transformation allows us to build a future-ready organization that can navigate uncertainties and seize new opportunities. By committing to this transformation, we not only strengthen our companies but also contribute to the overall advancement of the semiconductor industry. Let's work together to create a skilled, adaptable, and empowered workforce that will drive our sector forward.

*Read the **Full Interview** here:*

DRIVING WORKFORCE TRANSFORMATION:

APPLIED MATERIAL'S COMMITMENT TO A FUTURE-READY SEMICONDUCTOR INDUSTRY

Company

A Conversation with Jenny Chan, Country HR Lead, Applied Materials

Applied Materials Southeast Asia (AMSEA) is recognised for their holistic approach to upskilling and talent development

Through programmes like AppliedxPATHWAY and industry-wide collaboration, AMSEA has significantly enhanced Singapore's talent pool and set new standards in the electronics industry.

With a presence in Singapore since 1991, AMSEA has evolved from a sales and service office to a strategic hub, housing Applied's largest manufacturing facility outside the United States and playing a pivotal role in nurturing semiconductor talent across the region.

*Read the **Full Interview** here:*

Jenny Chan
Country HR Lead,
Applied Materials

Q: What does the Workforce Transformation Award (WTA) mean to you personally, and how do you see it influencing your future contributions to the semiconductor industry?

It is a great honor to receive this award on behalf of AMSEA. The award represents the hard work and dedication of our teams, as well as the collaborative and innovative culture of Applied.

The Workforce Transformation Award (WTA) by WSG, reinforces the need to build a skilled and competitive workforce in a rapidly changing labor market.

We have the tremendous opportunity at AMSEA to create a future-ready workforce where employees can grow their skills, perform their best work, and enjoy the opportunity to succeed and thrive in diverse roles in R&D, Field Services, Manufacturing and corporate functions.

Through our ecosystem partnerships, Applied helps to enable a future-ready workforce for Singapore's semiconductor equipment industry through enhanced training and advanced education programs. This includes an initiative with the Singapore Institute of Technology where Applied employees gain access to tailored learning modules in areas including AI and machine learning, smart manufacturing, robotics and automation, data science, and more.

We are committed to helping Singapore cultivate the workforce of tomorrow, and I am looking forward to achieving more for our employees, organization, and the semiconductor industry.

Q: Can you provide examples of how your workforce initiatives have made your organization more agile and future-ready, especially in Singapore's competitive landscape?

We just completed an inaugural 10-week course with SIT on an Advanced Certification Program on Data Analytics in Artificial Intelligence / Machine Learning for Semiconductor.

The course curriculum was custom curated by both Applied and SIT, equipping our employees with Data pre-processing, visualization, classification methodologies, as well as Artificial intelligent methods for process performance prediction competencies.

As part of our Digital Transformation and Job Redesign program, the course has helped support our Field Service Engineers transit into a newly established AIx Field Service Engineering Organization, where new competencies as change agents, project management, data statistical skills, programming, increased Artificial Intelligence / Machine Learning are required.

The collaboration with SIT has enabled workforce agility where we supported our Field Service Engineers transition into a new role, applying new skills in AI algorithms, Data science and Machine learning to support our field operations.

Beyond supporting Applied employees, the course will subsequently be released for open enrolment in Feb 2025, enabling more learners to benefit from the course.

Q: How do you view SSIA's role in driving unity and transformation within the semiconductor sector as we approach 2025 and beyond?

SSIA has played a crucial role in driving unity and transformation in the semiconductor sector. It has played a significant role in unifying and fostering collaborations with government and industry players. SSIA's role in Talent Development and education integration with the semiconductor industry will be crucial in addressing the skills gap ensuring a scalable, future ready workforce for the sector, as well as supporting Singapore's position as a Talent hub for semiconductor manufacturing and innovation.

Q: What message would you like to share with other industry professionals regarding the importance of workforce transformation in the semiconductor sector?

Amidst rapid technologies advancements (AI, Quantum computing, Industry 5.0, 5G, advanced semiconductor manufacturing), talent shortage, global competition, complex and volitive global market, Workforce transformation is crucial to remain competitive, relevant and driving Innovation.

It is essentially an organization mindset shift, rethinking how employee works, adapting new technologies and fostering a culture of continuous learning and agility.

"Those who stand still in a fast-moving world get left behind".

DRIVING WORKFORCE TRANSFORMATION:

GLOBAL FOUNDRIES' COMMITMENT TO A FUTURE-READY SEMICONDUCTOR INDUSTRY

Company

A Conversation with Tan Yew Kong, Senior Vice President and General Manager, GlobalFoundries Singapore

GlobalFoundries has demonstrated excellence in workforce transformation, providing employees with opportunities for upskilling and career progression. Their innovative skills ecosystem and commitment to diversity and inclusion have earned them recognition in the electronics industry.

Through a holistic talent development framework and extensive DEIB programmes, GlobalFoundries has created a high performing, engaged workforce that spans from early career professionals to industry veterans, fostering a culture of continuous learning and innovation.

*Read the **Full Interview** here:*

Tan Yew Kong
Senior Vice President and
General Manager,
GlobalFoundries Singapore

Q: How does receiving this award reflect your company's commitment to workforce transformation within the semiconductor industry, particularly in the Singaporean context?

The Workforce Transformation Award (WTA) is testament to our forward-thinking workforce development approaches to building and maintaining a high-performing and engaged workforce. As Singapore makes strides towards its Manufacturing 2030 vision, having a strong talent pipeline is crucial for GlobalFoundries (GF) and the wider manufacturing industry's long-term growth.

This accolade reinforces our belief that impactful workforce transformation requires job modernization through digital transformation and development initiatives that span every stage of the employee career journey. We have also invested significantly to curate a holistic talent development programme for our employees, whether it is providing more educational sponsorship opportunities at different career stages or partnering with industry and government organisations like SSIA, EDB and IHL to ensure that learning and development initiatives are aligned with market needs.

Q: What does the Workforce Transformation Award (WTA) mean to you personally, and how do you see it influencing your future contributions to the semiconductor industry?

The inaugural WTA is a recognition of the undertaking by GF to curate and continually optimise our holistic workforce development strategy and framework to attract, retain and develop talent.

As GF continues to shape our workforce development and engagement programs to support business growth, we shall continue partnering industry association and government organisations like SSIA, EDB and IHL on national level initiatives, and STEM outreach programs to attract talents into semiconductor industry.

Q: Which specific initiatives or strategies have been particularly impactful in the semiconductor sector and contributed to receiving this award?

Various scholarship programs (including IPP for PhD), Work-Study programs (for Degree and Diploma), STEM outreach programs, and Job modernization through digital transformation are some successful efforts by GF. A notable highlight is our partnership with EDB for our Accelerated Senior Technician Pathway programme. More than 10 technicians from ITE will come onboard for an accelerated development programme that will help them build up a strong foundation in engineering with practical hands-on experience in a world-class semiconductor Fab to pave their career progression within GF. This is just one aspect of GF's holistic talent development programme that covers every stage of the career journey.

Along with skills development, our commitment to Diversity, Equity, Inclusion, and Belonging (DEIB) has also been particularly impactful, especially in an industry that is traditionally male-dominated. We have enhanced our performance management and DEI hiring processes to ensure fair recognition of employee contributions. We are proud to have a female representation of 34% across our Singapore workforce, which is significantly higher than the industry average of 20%.

Q: Can you provide examples of how your workforce initiatives have made your organisation more agile and future-ready, especially in Singapore's competitive landscape?

The semiconductor industry is highly skills-intensive, and we strive to build a new skills ecosystem for our employees that focus on continuous upskilling, reskilling and cross-skilling. The ecosystem also provides insights into the overall skill health of our workforce, departmental gaps, and the richness of our talent pipeline. Leveraging these insights, we offer various development programmes to address any skill gaps and shorten learning curve with digital solutions, including global mentoring programmes, job shadowing, six months of compulsory On-Job-Training, educational sponsorships, opportunities to attend seminars and conferences, and more.

Q: How do you view SSIA's role in driving unity and transformation within the semiconductor sector as we approach 2025 and beyond?

SSIA plays an important role in fostering global collaboration and galvanising the industry, including local SMEs, to work together on pressing needs like the ongoing talent crunch. A great example is the Career Conversion Programme (CCP) and Job Redesign Reskilling (JRR), where SSIA, Workforce Singapore and partners like GF come together to support these mid-career professionals in their transition. We have been a strong supporter of CCP since 2016, and look forward to collaborating even more closely with SSIA and the ecosystem in 2025 and beyond.

Driving Workforce Transformation:

MICRON'S COMMITMENT TO A FUTURE-READY SEMICONDUCTOR INDUSTRY

Company

A Conversation with Sim Cher Whee, Vice President of People Strategy, Technology and Talent Acquisition, Micron Technology.

Micron Technology's multi-faceted approach to employee development includes mentoring, women's leadership programmes, and skills transformation initiatives. They have successfully reskilled their workforce in automation and digital technologies.

Micron's holistic learning approach, with a strong focus on inclusivity, has positioned them as an employer of choice in the electronics industry.

Their commitment to fostering a culture of continuous learning is evident through innovative programmes like the Micron University Digital Skills Academy and the AI upskilling initiative, ensuring their workforce remains at the forefront of technological advancements in the semiconductor industry.

Sim Cher Whee
Vice President of People
Strategy, Technology and Talent
Acquisition, Micron Technology

Q: What does the Workforce Transformation Award (WTA) mean to you personally, and how do you see it influencing your future contributions to the semiconductor industry?

Workforce Transformation is a business imperative to enable semiconductor industry to stay ahead of the curve. This award signifies recognition of our commitment to fostering a culture of continuous learning, inclusion and innovation. At Micron, we are committed to expanding our talent pathways, providing opportunities for all, as we embark on our journey towards a skill-based company and an AI-driven mindset. I believe we can achieve collective impact when companies come together to build a resilient and agile future workforce that propels our industry.

Q: How has your company adapted its workforce development strategies to align with both local and global trends in the semiconductor sector?

We have aligned our strategies with trends such as skill-based hiring, the growing importance of AI, and the shift towards sustainability. This is enabled by cultivating a culture of learning and mentoring as we make learning accessible, a purposeful habit, and a way to drive business impact. At Micron, we focus on building a future-ready workforce through further automating our operations, as well as equipping all team members with cutting-edge skills and providing them with AI tools to excel and contribute meaningfully to a dynamic industry landscape.

Q: What do you see as the most critical areas for workforce development in the semiconductor sector to ensure we remain competitive and relevant?

AI skills and sustainability are two critical areas. As automation and machine learning become more prevalent, our workforce must be equipped with the technical skills to manage and leverage these technologies effectively. We must continuously invest in workforce upskilling and reskilling to meet evolving industry demands, especially in areas like data science, AI, automation, and sustainable manufacturing. These areas will help the industry stay ahead of the curve while also contributing to environmental goals.

Q: What message would you like to share with other industry professionals regarding the importance of workforce transformation in the semiconductor sector?

"It is essential to embrace growth mindset, prioritize diversity and inclusion, leverage advanced technologies, foster a culture of innovation, and collaborate globally. By investing in our people and creating an environment that enable inclusion and innovation we can drive the industry forward and enable its continued success in the global market."

Read the ***Full Interview*** *here:*

DRIVING WORKFORCE TRANSFORMATION:

UTAC'S COMMITMENT TO A FUTURE-READY SEMICONDUCTOR INDUSTRY

Company

A Conversation with John Nelson, CEO and President, UTAC Group

UTAC is recognised for their comprehensive approach to employee development and workforce transformation.

Their Smart Factory Roadmap and leadership training programmes have positioned them as a leader in adapting to industry changes in the electronics sector.

Through innovative talent management strategies and a focus on continuous learning, UTAC has fostered a culture of innovation and adaptability. Their commitment to creating a skilled, diverse, and future-ready workforce has not only enhanced employee capabilities but also strengthened UTAC's competitive edge in the rapidly evolving semiconductor industry.

*Read the **Full Interview** here:*

John Nelson
CEO and President,
UTAC Group

Q: How does receiving this award reflect your company's commitment to workforce transformation within the semiconductor industry, particularly in the Singaporean context?

I believe that winning the award is an external recognition of the Singaporean Management team's efforts to transform and upskill the work force. As we transition to more advanced technology in an increasingly automated environment and migrate to an AI environment, the expertise of our engineering workforce must be enhanced through training and on-the-job learning. I believe that the direction in terms of advanced technology, automation and AI is very relevant to operating in the Singapore semiconductor industry environment.

Q: What does the Workforce Transformation Award (WTA) mean to you personally, and how do you see it influencing your future contributions to the semiconductor industry?

Personally, I feel proud of the team's work as we evolve to a high value-add operational environment. Management must take action to change through revolution or evolution. I believe as the industry demands in Singapore evolve, we must do the same to remain competitive.

Q: Which specific initiatives or strategies have been particularly impactful in the semiconductor sector and contributed to receiving this award?

As mentioned above, automation, higher value-added technologies and AI have been the major areas of focus while stressing the need to retrain and rebuild the current workforce. While we have also hired experienced personnel in these areas, concurrently, we have also focused on employee retention and upskilling.

Q: How has your company adapted its workforce development strategies to align with both local and global trends in the semiconductor sector?

With the global growth in semiconductors comes a shortage of experienced talent both locally and globally. Embarking on upskilling and developing current employees who are committed and loyal to the company is a logical conclusion.

Q: Can you provide examples of how your workforce initiatives have made your organization more agile and future-ready, especially in Singapore's competitive landscape?

The workforce initiatives demonstrate UTAC's commitment to our employees and management team. The employees embrace the need to change and feel motivated by their new experiences. Retention is higher since the employees see that management recognizes the need for the company and employees to adapt to remain competitive.

Q: How do you view SSIA's role in driving unity and transformation within the semiconductor sector as we approach 2025 and beyond?

SSIA has members from across the entire semiconductor supply chain. The association brings the members together to share recent developments in the industry and hosts conferences to bring senior leaders from different areas of the industry together. These events align expectations on the industry growth and trends. SSIA also establishes focus groups from multiple companies that enable sharing, alignment and industry thrusts and standards.

Q: What do you see as the most critical areas for workforce development in the semiconductor sector to ensure we remain competitive and relevant?

I believe the use of AI for data analytics, predictive machine monitoring and problem solving will continue to be a critical area for workforce development. Automation with remote machine monitoring and reduced manual interfaces with the equipment and product will, if implemented correctly, improve quality, cost and efficiency.

Q: What message would you like to share with other industry professionals regarding the importance of workforce transformation in the semiconductor sector?

The semiconductor industry must adapt to several complex factors in these changing times: geo-political challenges, evolving technologies, manpower and expertise shortages, and cost challenges. The stability and capability of the company's workforce is critical. We believe that an employee who feels motivated by continuous upskilling and learning will remain loyal to the company and can grow and evolve with the industry.

CALVIN LIM FROM MEGA VALVE AND FITTING PTE LTD

WINNER OF 'DESCENT OF THE HUNTER' BY BOBBY YEO

About the Artwork

A majestic eagle descends from the heavens, its wings stretching wide against a cerulean sky. With talons extended and legs thrust forward, the bird is poised for a powerful strike, capturing the raw and untamed essence of nature's hunt. The fierce determination in its eyes reflects an unyielding focus on its unseen prey below. Each feather is rendered with meticulous detail, showcasing the eagle's strength and agility. The air is thick with tension as this apex predator approaches its target with unwavering precision, freezing a moment of sheer beauty and primal intensity in time.

What motivated you to participate in this charity art auction, and why was this cause important to you?

I have always believed in giving back to society and the importance of instilling good values in my children from a young age. By engaging in acts of kindness and supporting the less fortunate, I aim to lead by example, showing my children how positive actions can make a difference in the community and shape a more compassionate future.

What impact do you hope your contribution will have on the charity and the communities it serves?

I hope my modest contribution serves its purpose and brings positivity into their lives. I believe that through influence, we can create a meaningful impact and raise greater awareness for the community, encouraging more people to join in and support those in need.

How do events like this auction align with your broader approach to corporate social responsibility?

As I mentioned earlier, I believe that I must be the change I wish to see in the world. I hope to inspire those around me to join in and support such meaningful causes. By leading with action, I aim to motivate others to contribute and make a difference in our community. Together, we can create a positive impact and drive real change.

Was there a particular piece of art or artist in this auction that resonated with you, and why?

The piece I successfully auctioned, "Descent of the Hunter", truly inspired me. The soaring eagle symbolizes continuous determination, strength, and unwavering goals—qualities that have always been mottos throughout my life. Its powerful imagery resonates deeply with my personal journey and aspirations.

What does winning this auction bid mean to you in terms of giving back to the community?

I don't see this auction as a win for myself; my main aim was to contribute to our society. What matters most is that more talented individuals are being recognized. We should never let talent go unnoticed, and supporting initiatives like this ensures that their brilliance shines through.

How does your commitment to diversity, equity, and inclusion shape your overall corporate culture?

This approach will anchor the organization in fairness and ethical behaviour, while reinforcing our company values, "GREAT"—Gratitude, Responsibility, Excellence, Agility, and Teamwork. By building a positive working environment, employees will feel more engaged and motivated, leading to higher performance and a stronger sense of unity within the team.

Can you share an example of how you have integrated DEI into your workplace practices or external partnerships?

Internally, our organization recognizes staff achievements through awards for outstanding performance, long service at our annual events. These recognition awards celebrate employees' hard work and dedication, reinforcing a culture of appreciation and motivation within the team.

Externally, we encourage our employees to participate in community organizations with diverse backgrounds. For such, our recent involvement of charity walks to support our senior community. This initiative to reduce social and economic disadvantage, the values of diversity, equity and inclusion are central with our DEI values.

How do you ensure your DEI initiatives reach all levels of your organization, from leadership to employees?

We encourage understanding to cultivate employee equity and are proactively driving change by maintaining regular communication with the leadership team about the business and moral imperatives of DEI. I stress the importance of ongoing dialogue with employees to ensure everyone grasps its significance. By setting clear expectations and providing accountability, we promote inclusivity not only as a policy but as an integral component of our corporate culture.

What are some of the biggest challenges you've encountered in implementing DEI strategies, and how have you overcome them?

Low staff engagement remains a challenge when it comes to committing to DEI, as misconceptions, stereotypes, and feelings of being personally attacked can hinder progress. The key in this long-term effort lies in persistence and fostering an environment where open dialogue is encouraged. Creating safe spaces where employees feel comfortable in sharing their experiences and concerns can be instrumental in dispelling misconceptions and easing fears. By actively inviting participation, employees can better understand that DEI efforts are about fostering inclusion and growth, not about blame or division.

How do you see your DEI efforts evolving over the next few years?

I believe that with proper training and increased awareness, we can make significant improvements. As long as we stay focused on our goals and not lose sight of our vision, we will get there eventually. Consistency and commitment will guide us on this journey.

Were there any experiences or values from your upbringing that shaped your passion for giving back and supporting charitable causes?

Yes, my upbringing played a significant role in shaping my interest in giving back and supporting charitable causes. Growing up, my family emphasized the importance of kindness, empathy, and community service. The values of gratitude and compassion that were instilled in me from a young age continue to drive my commitment to charitable causes. I believe that giving back is not just a responsibility but a privilege, and I strive to pass these values on to my children.

What personal values or life experiences motivate you to champion both philanthropy and inclusivity in your professional and personal life?

I strongly believe in helping and giving back in both personal and professional life. Finding a right purpose in life, for a good cause, is always important and it will have a long-lasting effect in future years to come.

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MEGA VALVE & FITTING PTE LTD

JOE TAN FROM MSV SYSTEMS & SERVICES PTE LTD

WINNER OF 'GOLDFINCH' BY CHRISTINA LAU

What motivated you to participate in this charity art auction, and why was this cause important to you?

MSV regularly donates to charity. We participated in the charity art auction by SSIA last year & decides to participate again this year. Having enough & helping others guides MSV CSR, if we are able, we help.

What impact do you hope your contribution will have on the charity and the communities it serves?

We hope our contribution can help the charity to better serves the communities it supports & also encourage the artist in his/her work.

About the Artwork

"Goldfinch" features a bird with striking yellow and black feathers resting gracefully on a plant. The vibrant colors of the bird contrast beautifully with the lush green foliage, creating a captivating and serene scene. The artist's attention to detail highlights the delicate nature of the bird and the harmonious connection between the creature and its natural surroundings.

How do events like this auction align with your broader approach to corporate social responsibility?

Having enough & helping others guides MSV CSR, if we are able, we help. Participating in charity auction is one way to do so.

Was there a particular piece of art or artist in this auction that resonated with you, and why?

The Goldfinch reasonates with me, it is quite chubby like me, but certainly more beautiful.

What does winning this auction bid mean to you in terms of giving back to the community?

We are happy to contribute back to the community.

How does your commitment to diversity, equity, and inclusion shape your overall corporate culture?

Our corporate culture is quite inclusive & welcomes people from diverse background & ability who are motivated to contribute to the growth of the company. All are treated equally.

Can you share an example of how you have integrated DEI into your workplace practices or external partnerships?

We have staff from all ages, races, genders, religions, etc in our company.

How do you ensure your DEI initiatives reach all levels of your organization, from leadership to employees?

Leadership & employees can see the diversity we have in the company. Long service awards & company trips are equally applied to all staffs regardless of position. We also have unscheduled cooking & makan session at our company whenever we feel like it with everybody eating together to facilitate communication & integration.

What are some of the biggest challenges you've encountered in implementing DEI strategies, and how have you overcome them?

Aligning staff's mindset is probably the main challenge as different people may perceive the same thing differently, but this can be slowly aligned over time as they see how the company treats everybody.

How do you see your DEI efforts evolving over the next few years?

As younger generation join us, we notice that they have different mindsets compared to the older generation. Hopefully over time, they will integrate well & evolve to understand that in an increasing complex world, to go far, all will need to move together in a DEI way.

Were there any experiences or values from your upbringing that shaped your passion for giving back and supporting charitable causes?

I came from an average family who was a recipient of charity support when I was young. Now that my life had gotten better, I am happy to contribute back to the society individually, or through my company, as long as we are able to.

What personal values or life experiences motivate you to champion both philanthropy and inclusivity in your professional and personal life?

As a service engineer previously, I had travelled & seen poverty & hardship around the region. In the end, it is not about having huge amount of wealth (as a matter of fact, Steve Jobs like many other before him, has huge amount of wealth, but they are all dead...), it is about having enough & helping others.

JOHN NELSON, PRESIDENT & CEO / COO OF UTAC GROUP

WINNER OF ‘LET OUR LIGHT SHINE!’ BY MOY SAW HAN

About the Artwork

"Let Our Light Shine!" depicts a landscape acrylic painting of a winter starry night. Lift up your eyes to see the beauty of this starry night. Twinkle, twinkle, beautiful stars illuminate the cold, wintry sky. In the midst of darkness and cold, let our inner light shine forth, guiding and bringing cheer to those seeking solace.

What motivated you to participate in this charity art auction, and why was this cause important to you?

I believe we should all "give back" when suitable occasions arise. I am a veteran of the semiconductor industry and participating in the SSIA auction was an appropriate occasion. The art was painted by an artist with sight limitations, and I felt it had emotional value due to the colour schemes, paint texture and airy spirit.

What impact do you hope your contribution will have on the charity and the communities it serves?

I believe the donation will support the needy and vulnerable residents in the North East District and as such, the donation will reach people in need.

How do events like this auction align with your broader approach to corporate social responsibility?

On this occasion the bid was personal; however, over the last 20 years while leading companies, I have tried to establish a culture of social responsibility by supporting the local community through charitable donations, encouraging employee participation to support those less privileged, blood drives etc.

Was there a particular piece of art or artist in this auction that resonated with you, and why?

I am not an art collector, however, I know what I like . Paint-

ing was Van Gogh style with swirling clouds, bright colors and a backdrop of the countryside. These features align with my enjoyment of being in the countryside , similar to Ireland on a bright sunny day where I grew up.

What does winning this auction bid mean to you in terms of giving back to the community?

I am lucky enough to be in a position to give back for the right cause so why not! I grew up in a working-class neighbourhood in Belfast and I can appreciate that many people have a tough life. If I can help someone then I should.

How does your commitment to diversity, equity, and inclusion shape your overall corporate culture?

As CEO, my commitment to diversity, equity, and inclusion sets the tone for our corporate culture. I believe in leading by example and ensuring every member of our team feels valued and empowered. This commitment goes beyond policies; it is about fostering a welcoming and supportive workplace where everyone can thrive and contribute their best.

Can you share an example of how you have integrated DEI into your workplace practices or external partnerships?

An example of integrating DEI into our workplace practices is our Equal Employment Opportunities and Discrimination, Harassment, and Retaliation policies. These policies reflect our commitment to fostering a fair and inclusive environment for all employees. They reinforce our dedication to preventing discrimination and harassment and promoting a workplace where everyone feels respected and supported.

How do you ensure your DEI initiatives reach all levels of your organization, from leadership to employees?

We ensure our DEI initiatives reach all levels through focused communication and targeted training. Our robust communication strategy provides regular updates, while diversity and engagement workshops ensure everyone understands and supports our commitment to diversity, equity, and inclusion.

What are some of the biggest challenges you've encountered in implementing DEI strategies, and how have you overcome them?

One of our biggest challenges has been getting everyone on board and understanding the importance of DEI. To tackle this, we have implemented education programs aimed at increasing awareness and demonstrating the positive impact of our DEI initiatives through effective communication.

How do you see your DEI efforts evolving over the next few years?

Looking ahead, we are focused on continuous improvement. We plan to increase our involvement in community initiatives that promote diversity, equity, and inclusion, demonstrating corporate social responsibility and contributing positively to society. Additionally, we aim to foster a more inclusive environment where everyone can thrive.

Were there any experiences or values from your upbringing that shaped your passion for giving back and supporting charitable causes?

As I mentioned, I believe that growing up during "the troubles" in Belfast exposed me to another side of life. Luckily, I joined the semiconductor industry and have enjoyed the financial benefits of the journey. This has enabled me to support good causes where suitable opportunities arise.

What personal values or life experiences motivate you to champion both philanthropy and inclusivity in your professional and personal life?

Having had a C role in several companies with a high number of employees enables one to empower the employees to contribute as individuals or as a group. The reality is that many people wish to participate in company sponsored events to support those who are less privileged. During such events, one can see the enjoyment of both the employees and those being hosted. This is something that makes me feel good and happy to have the opportunity to give back!

A JOURNEY OF CREATIVITY AND PASSION:

LEANNE'S PATH TO SSIA

Background and History

I've always been a creative and carefree individual, someone who thrives on coming up with new ideas and bringing them to life. In my current role as SSIA's Marketing and Communications Executive, I get to channel this artistic nature into every aspect of my work. Before joining SSIA, I started my career in a manufacturing company, where I was first introduced to the world of B2B marketing. This experience opened doors for me to explore project sites, assist in event management, lead marketing campaigns, and take charge of content creation.

Early in my career, I kept my options open, driven by a desire to learn from talented professionals and gain fresh perspectives. This journey eventually led me to SSIA, where I hoped to immerse myself in the dynamic field of B2B marketing within the semiconductor industry.

Joining SSIA

My decision to join SSIA was inspired by my father, who has long been a part of the semiconductor industry and has always been a pillar of support for our family. Eager to learn more about this crucial sector, I decided to take the bold step of joining SSIA, the trade association that unites semiconductor companies across Singapore.

Since joining SSIA, my perspective has expanded significantly. I've gained exposure to a diverse range of companies within our ecosystem, from thriving SMEs to influential global players. This experience has given me a deep appreciation for the vital role that semiconductors play in Singapore's economy. Additionally, the vibrant location of our office in Paya Lebar, with its rich selection of food and coffee options, was another appealing factor for me.

One of the most transformative experiences I've had was during my first week at SSIA, when I participated in the IC Summer Design Camp. Surrounded by students who likely had more industry knowledge than I did, I embarked on a journey of discovery, visiting companies like AMD, STMicroelectronics, and GlobalFoundries. This experience was a crash course in semiconductors, leaving me with a newfound respect for the industry.

Witnessing how these visits impacted the students—sparking passion and opening new career paths—reinforced my belief in the importance of building knowledge and enthusiasm for the next generation.

Professional Passions

As a Marketing and Communications Executive, I find immense joy in content creation. Whether working on brochures, photography, video editing, or posters, I'm passionate about the small details that make a story "digestible" and visually pleasing.

One of my most notable projects was the video summary for the Leadership in Engineering Run #3, which is featured on SSIA's LinkedIn and YouTube channels. Over the course of three days, I shadowed a group of industry leaders, capturing their journey and compiling the footage into a cohesive and engaging video. Despite the tight turnaround and the sheer volume of footage, I was able to successfully highlight the laughter, teamwork, and energy that characterized the event. Through my lens, I witnessed how our course facilitators inspired these leaders to embrace courage, empathy, and the power to challenge industry stereotypes.

And yes, the food was excellent—a detail I don't overlook. I highly recommend the Leadership in Engineering course to any industry leader.

Personal Motivations and Inspirations

I draw inspiration from two main sources: my family and my curiosity. My family provides the unwavering support I need to pursue my creative passions, while my curiosity drives me to explore the world and all it has to offer. This curiosity fuels my excitement for the paths I have yet to take and the connections I have yet to make.

I find motivation in coffee, art, and travel. Luckily, the SSIA office is surrounded by an array of coffee options—Yakun, Old Tea Hut, Luckin Coffee, Starbucks—perfect for battling the post-lunch food coma. It's the small joys, like music, my fluffy shih-tzu, and globetrotting, that keep me going. Among my favorite travel destinations is Budapest, Hungary, and I dream of visiting Madrid to see the masterpieces in the Museo del Prado, as well as embarking on the Annapurna hike in Nepal.

Future Aspirations

Looking ahead, I'm eager to deepen my understanding of brand strategy. At SSIA, marketing and branding strategies are constant topics of discussion, particularly with the guidance of our Executive Director, Mr. Ang Wee Seng. Our team is always exploring innovative ways to invigorate the industry's image and share the untold stories within the semiconductor ecosystem.

I believe that people are at the heart of marketing; it's about positioning the brand in a way that sparks curiosity and fosters loyalty. My goal is to achieve this for the semiconductor industry, particularly in reaching and inspiring the younger generation.

Advice for Others

My advice is simple but powerful: perseverance shapes character. At SSIA, everyone pulls their weight and takes pride in their work. Our team wears many hats, yet we continue with a smile, even during stressful periods. The support we provide each other is invaluable, and I encourage others to never hesitate to ask for help when needed.

For me, success in my role comes from seeing the bigger picture. This means creating a strong brand image for the semiconductor industry, building its prestige, and driving demand. It's a vision I'm committed to realizing, one creative project at a time.

SSIA
Singapore Semiconductor Industry Association

SEMICONDUCTOR AWARENESS DAYS 2024

INSPI

RESHAPE OUR FUTURE

IMAGI

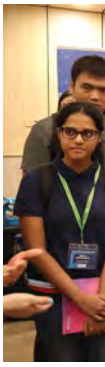
A MOVEMENT

RE

CONNECT

NATION

INNOVATION



SEMICONDUCTOR AWARENESS DAYS 2024

The SSIA Semiconductor Awareness Days are more than just events—they're a movement to inspire and connect Singapore's next generation with the technology that powers the world. Building upon the success of our annual Semiconductor Electronics Day – Singapore's largest student-focused outreach for the semiconductor sector – this is an extension of bringing together top industry leaders and passionate educators to open doors to an industry that's reshaping the future.

This collective drive isn't just a showcase; it's the hallmark of our semiconductor industry's commitment to shaping its future by inspiring the leaders and innovators of tomorrow.

For companies, these Awareness Days are a powerful platform to spotlight breakthrough technologies, share career insights, and build direct connections with the talent of the future. For students, it's a unique opportunity to step inside the semiconductor world—where imagination meets innovation. Here, you can uncover endless possibilities, explore career paths, and make informed choices about a future in this rapidly evolving field.

For every curious engineering student or tech enthusiast, this is your moment. Network with leaders, get hands-on experience, and find the career of your dreams within the tech shaping tomorrow. Let's build a future-ready workforce and ensure Singapore remains a global innovation hub—starting with you! Don't miss your chance to be part of something extraordinary.

Imagine meeting the industry's best right in your school, discovering pathways from IC design to wafer fabrication, and exploring the tech driving everything from AI to 5G. Semiconductors are the bedrock of our digital world, and we're making it easy to connect with this industry because we believe in its power to transform lives and inspire dreams.

A fabulous way to scout top-tier talent! We're meeting tomorrow's engineering stars, up close and personal."

– Young engineers and HR recruiters in Semiconductor

This is exactly what we need for our company, our industry, and our future! It's the kind of energy and opportunity that drives real change."

– NTU Alumni, Senior Engineer in Semiconductor

It's such a brilliant way to share our knowledge and passion with students!"

– Engineer in Semiconductor

Dakshini, a final-year Master's student in Material Science and Engineering at NUS, said, “Being an international student, I made great connections with industry experts and gained insight into the roles offered by companies. The SSIA Semiconductor tour was top-notch—I visited every booth and interacted with experts.”

Her experience underscores how SSIA Awareness Days serve as a gateway for students eager to break into the industry, offering direct engagement that could lead to future employment.

Inspiring a Passion for Semiconductors

For Austin, a third-year EEE student at NUS and SSIA SAY Ambassador, the event reaffirmed his enthusiasm for semiconductor technology. “It was lively with lots of interaction between students and companies,” he remarked. “I enjoyed learning more about the technical side of semiconductors—how sand can be transformed into computers is fascinating!”

Austin’s words capture the excitement SSIA Awareness Days inspire in students, giving companies a chance to cultivate and guide the next generation of engineers.

Building Connections for Future Careers

One of the key benefits of SSIA Awareness Days is the opportunity for students to engage directly with industry experts and potential employers. Dakshini emphasized the importance of these connections: “I’ve been waiting for this opportunity to create meaningful relationships with industry leaders. Thanks to SSIA and NUS, I accomplished that today.”

Austin reflected on the importance of company engagement, saying, “It was inspiring to see companies explain not just the jobs but the technical aspects of their work, helping students like me understand where we might fit in the industry.”

SEMI
AWAR
2024

More information:
https://ssia.org.sg/ssia-semiconductor-awareness-days/

Contact the SSIA Secretariat team to get involved in Semiconductor Awareness Days 2025:
secretariat@ssia.org.sg

2024 SNAPSHOT

NURTURING YOUNG TALENT

2024 SAY AMBASSADOR PROGRAMME

40 Student Ambassadors, 24% Female 76% Male

28 Mentors and 15 HR Reps from top companies

Semiconductor Awareness Days spanning August to November 2024, welcoming **8,000** STEM students collectively across **8** Institutes of Higher Learning

SSIA
Singapore Semiconductor Industry Association

IC DESIGN SUMMER CAMP 2024

60 Students, 50% are SAY Ambassadors

12 Industry expert speakers, sponsored by 8 companies

SSIA's Career/School Talks have reached 6,030 students in 2024. Will you join us in nurturing young talents in 2025?

2024 SNAPSHOT

ADVANCING PROFESSIONALS

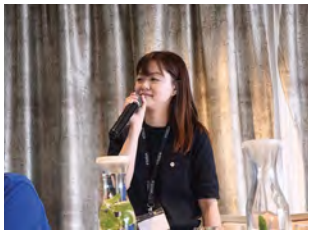
LEADERSHIP IN ENGINEERING 2024

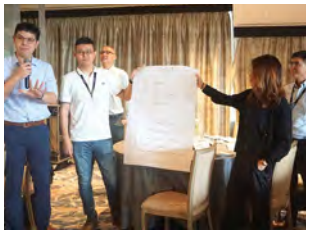
55 Over-Capacity participants across 2 runs over 2024, with the first in-person course in July

A HEALTHY MIX

23% Female

77% Male





From 2019 to 2024, CCP (Career Conversion Programme) has facilitated **2,500** placements **65** semiconductor companies

LEADERSHIP COURSE SPECIALLY CURATED FOR SEMICONDUCTOR LEADERS

Participants represent a diverse cross-section of the industry, encompassing segments such as Fabs, Fabless companies, Equipment Manufacturing, Research Institutes, and OSATs. This diversity has facilitated valuable cross-pollination of ideas and enabled participants to expand their professional networks.

Workforce Singapore

Determined to drive diversity and creating inclusive opportunities, with a women to men ratio of

1 : 4

As smart factory transformations advance, companies increasingly use CCP funding to reskill their workforce, ensuring growth without layoffs. This collaboration, supported by industry associations and Workforce Singapore (WSG), builds a talent pool ready for future challenges.

PIONEERING SEMICONDUCTOR INNOVATION:

AN INTERVIEW WITH GARY WIDDOWSON, CTO OF ASMPT SEMI SOLUTIONS

ABOUT ASMPT LIMITED

ASMPT Limited, founded in 1975 and headquartered in Singapore, is a leading global supplier of hardware and software solutions for semiconductor and electronics manufacturing. At ASMPT, our comprehensive offerings encompass semiconductor assembly, packaging, and surface mount technology, addressing everything from wafer deposition to the packaging of delicate components. With our vision of "**enabling the digital world**," we empower our customers, including top OEMs and foundries, to overcome significant technological challenges. By closely partnering with clients, we deliver advanced solutions that enhance productivity and reliability, while our ongoing investment in R&D ensures we are able to meet the evolving needs of the microelectronics sector and to help shape the future of electronics manufacturing.

What are the primary forces shaping the current semiconductor manufacturing landscape, and how is ASMPT responding to these changes?

The semiconductor industry today is driven by several major trends, including the rise of high-end computing, generative AI, and advancements in automotive electrification. At ASMPT SEMI Solutions, we are tackling these challenges through our two business groups, one focusing on mainstream applications that provide high-end bonding solutions such as wire bonders, die bonders, and encapsulation machines. Here, our customers are really focused on cost of ownership, so they need machines that are not only productive and precise but also able to readily operate using fewer people.

The second group provides Advanced Packaging solutions that cater to a very wide and dynamic series of requirements in a fast-changing environment. These are typically more cutting-edge solutions that involve customers transitioning from traditional monolithic chips to the packaging of chiplets for better efficiency and performance. Here our machines must bond these chiplets with pinpoint accuracy and efficiency. Flexibility is the order of the day, to enable our customers to innovatively mix and match components such as high-bandwidth memory, GPUs, and CPUs, while balancing overall cost of ownership.

Interview with **Dr. Gary Widdowson**,
Chief Technology Officer, ASMPT SEMI Solutions

How does ASMPT address the evolving demands of the semiconductor industry?

At ASMPT, we prioritize flexibility and responsiveness in our technology offerings to keep pace with the dynamic semiconductor market.

For instance, we recognize the increasing demand for advanced power solutions driven by the rapid growth of end applications like electric vehicles. As these vehicles require higher efficiency and reliability, our advanced silver sintering technology becomes essential for power electronics. This technology enables robust, temperature-resistant connections that excel in high-frequency and high-temperature environments, optimizing the performance of next-generation power modules.

In light of the shifts toward chiplet integration—modular components that can be combined to create more complex systems—our Advanced Packaging solutions have become crucial for efficiently assembling these chiplets. Innovation drives our adaptation. Historically, the focus in the semiconductor industry was on shrinking wafer nodes from 45nm down to 7nm (< 3nm), which has led to progressively steeper manufacturing costs. Now, we are seeing more and more customers embrace chiplets for their cost-effectiveness and versatility, recognizing that not all functions need the latest nodes.

Our solutions are designed to accommodate various configurations. We work very closely with our key customers to develop solutions that will allow them to assemble their components according to their specific requirements. By enabling the efficient assembly of chiplets, we help them balance optimal functionality with cost, ultimately shaping the future of semiconductor technology through innovation and adaptability.

What strategies does ASMPT employ to foster successful collaboration with customers and drive innovation?

Our commitment to R&D is fundamental to fostering successful collaboration with our customers, who are the heartbeat of our innovation. By closely understanding their evolving needs, we can anticipate what they require and co-develop customized solutions together. This commitment is supported by our global network of R&D centres, across Asia, Europe, and the Americas, enabling us to mobilize specific teams for targeted product development in response to advanced customer requests.

For example, we worked closely with a customer on thermocompression bonding—a technology that's been around for about 20 years. They faced challenges in finding a solution that was ready for high-volume manufacturing, so we collaborated to create a tailored solution that met their exacting requirements. This experience has deepened our understanding of thermocompression bonding, allowing us to refine our offerings and position ourselves as leaders in this technology.

Our strong R&D capabilities also allow us to leverage diverse talent and specialized expertise, harnessing regional strengths to drive innovation across our product lines. For instance, our Netherlands R&D specializes in mechatronics, which enables the development of both mainstream and advanced packaging products for our facilities in Singapore and Hong Kong. This is an example of utilizing specialized knowledge from around the world to tailor solutions to meet specific customer needs and maintain our competitive edge. This global approach accelerates our innovation processes and ensures that we can stay at the forefront of industry trends.

How does ASMPT envision its role in advancing sustainability within the semiconductor industry, and what impact do you hope to achieve through your initiatives?

As a leader in the electronics and semiconductor manufacturing industry, ASMPT is strongly committed to taking the lead in ESG. We have committed significant resources to our ESG initiatives. For example, we are a "Leadership Level" Founding Member of the Semiconductor Climate Consortium (SCC), and actively support the SCC's efforts to reduce global greenhouse gas emissions and uphold the Paris Agreement. We also lead the SCC's Scope 2 Emissions Working Group and help promote low-carbon energy access and adoption across the entire semiconductor value chain. This initiative is vital to our ESG strategy and aligns with our commitment to "ASMPT Net Zero 2035." Internally, we focus on energy reduction via equipment upgrading and energy-efficient practices that minimize energy usage, striving to reduce our environmental impact and help enable a sustainable future for society as a whole.

ASMPT enabling the digital world

SCALING CHALLENGES IN SILICON PHOTONICS:

AN INSIGHTFUL CONVERSATION WITH PROFESSOR GRAHAM REED

Director and Professor of Silicon Photonics,
Optoelectronics Research Centre,
University of Southampton, UK

Silicon photonics has been heralded as a transformative technology for the semiconductor industry. What do you see as the most significant challenges and opportunities in scaling silicon photonics for widespread commercial applications?

In some sensing the scaling is already beginning with the foundries buying into the technology. Most of the large CMOS-related foundries now have activities related to Silicon Photonics, largely driven by the success of the technology in data centre related activities. However, some even bigger opportunities are coming in emerging applications such as healthcare, environmental sensing imaging (e.g. LIDAR for mobile platforms), AI, Quantum, space, and of course, other parts of the communications networks. One of the challenges associated with new applications is that in some cases they are driven by SMEs who can find it difficult to get access to foundry services, either because they cannot yet guarantee volume manufacturing, or because they want to do further research to demonstrate proof of concept etc. Sometimes, they don't even know which foundry technology best suits their application (not all foundries offer exactly the same technology), so a flexible, open source, pre-competitive foundry model is helpful at the early stages, so that IP is not encumbered, and proof of concept can be de-risked, both in terms of the exact technology and the cost.

With the growing demands for high-speed data transmission and low power consumption in various industries, how do you envision silicon photonics shaping the future of semiconductors?

Since Silicon Photonics offers both high speed and low power (and also low cost), it is central to the future of many aspects of communications technology, and hence semiconductors. Add to this the potential of the emerging applications, and some truly mass markets can be addressed by Silicon Photonics. In the research lab we have already demonstrated more than 300Gb/s for a single wavelength lane, but there is some feeling in parts of the community that even faster data rates will be driven by other materials on a silicon platform, such as thin film Lithium Niobate or BTO, maybe even Graphene. Personally, I think an all-silicon solution is preferable where possible, as the fabrication is less complex, and more likely to be compatible with existing foundry processes. However, there will be applications where very low loss, or ultra-low power might demand integration of other materials, and Silicon Photonics already integrates compound semiconductors for lasers, Germanium for detectors, and electronics for drivers and amplifiers. So in short, Silicon Photonics, and photonics in general, is central to the future of Semiconductors, especially in areas where conventional electronics can no longer be scaled.

As the semiconductor industry moves towards more advanced technologies, how do you think silicon photonics can contribute to the development of next-generation computing systems, particularly in the context of quantum computing and AI?

Photonics is already being applied to reorganise the architectures of some computers, allowing more effective deployment of the components of a typical computer. This is because communications in the optical domain is more efficient than in the electrical domain at high speeds, so certain parts of the computer no longer need to be very close together for example.

Furthermore, Silicon is already the platform of choice for scale up of some quantum applications, and if wavelengths are required that are not compatible with silicon itself, the Silicon Nitride offers huge potential. These days Silicon Photonics is regarded as more than just Silicon itself as the guiding material. Other platforms such as Silicon Nitride, Silicon Germanium, undercut Silicon or Germanium, or Germanium on Silicon are all regarded as "Silicon Photonics", and enable compatibility of wavelengths from parts of the UV to the Mid IR wavelengths, making the technology very applicable to many applications in quantum, not just computing.

With regard to AI, the parallel processing capability and high speed of photonics circuits is making some AI processing functions particularly suitable for photonics in general and Silicon Photonics in particular. Add to this the capability of programmable and reconfigurable Silicon Photonics, and there are significant opportunities for the technology to advance AI. Furthermore, Silicon Photonics is intrinsically linked to CMOS electronics, so a dual function AI chip, incorporating both electronics and photonics has potential for all to see.

Integration of photonics with electronics is a critical area of research. What breakthroughs do you anticipate in the next five to ten years that could redefine how we design and manufacture semiconductor devices?

As with most technologies, there is not a global answer to this question. The answer will be different for different applications. For example, for many sensing or imaging-based applications, where power is less critical, and speed is not a primary driver, the technology is already there for integration of electronics and photonics, and it is the sensing demonstrations that are the subject of research and development.

However, I suspect the question is mainly related to communications, where low power, high speed, power density, aggregate data rate and data rate density are all critical. For many years, monolithic integration of electronics and photonics was seen as the solution. However, the cost of electronics at very high speeds makes the real estate very expensive, so adding photonics to such a platform makes little commercial sense, as the photonics is very large compared to electronics, and hence takes up a lot of expensive real estate. There are examples of work that has made some good progress in this area such as the work of Ayar Labs, but in general, most of the community sees some sort of hybrid or heterogeneous integration of electronics and photonics as the solution. Even then, there needs to be efficient integration of the two technologies, both in terms of power consumption (in both the electronics and the photonics devices), loss, and signal integrity. In communications, DSP is often used to recover signal integrity, but electronic DSP consumes significant power, so translation to some level of equalisation or DSP in the optical domain would be extremely beneficial. In fact many processes are more efficient in the optical domain than the electrical, so transferring more signal processing to the optical domain would make sense.

Other than that, conventional wisdom is that the photonics and electronics should be as close together as possible, hence the surge of interest in co-packaged optics. Loss (and other performance metrics) is significantly lower (more efficient) in the optical domain, so the aim is to get into the optical domain as quickly and efficiently as possible. For many years we have been arguing that more system level design, or co-design of the electronics and photonics is required, rather than independent design that is subsequently integrated, the latter typically resulting in inferior performance.

Considering the global push towards sustainability, how can silicon photonics contribute to reducing the environmental impact of the semiconductor industry, and what role will it play in the development of green technologies?

I think there are two aspects to this question. Firstly, there is the question of how to make semiconductor processing itself greener, and many sectors of the industry are working on this, and know better than me how to take this forward.

However, there is also the question of what photonics can bring to make industries greener. For example, if we miniaturise large industrial machines to chip scale devices, then both manufacturing and operation becomes greener by default. For example, replacing benchtop (or larger) chemical analysis or healthcare sample analysis to a chip-scale sensor not only makes the sensor greener, but potentially makes deployment easier, response times faster, and in the case of healthcare, patient experience better. Imagine real time cancer analysis in every doctor's surgery, or real time drug concentration measurement in blood on every hospital ward. Or environmental monitoring on mobile platforms on land or sea.

This can be extended to all sorts of other applications; chip-scale LiDAR vision in autonomous vehicles, chip scale, lightweight communications in space, photonics infrastructure driving mobile phone communications, photonics that enables more efficient computing.... This list goes on.

British High Commission Singapore
University of Southampton
Light Optoelectronics Research Centre

PIONEERING LEADERSHIP:

DRIVING INNOVATION AND UNITY IN THE SEMICONDUCTOR INDUSTRY

A Q&A with Angela Yeh,
Senior Director,
Realtek Semiconductor Corp

Personal Motivation and Leadership Values **– As a leader, what core values drive your approach to uniting diverse players within the semiconductor industry? Can you share a specific case study that exemplifies how these values shaped a successful collaboration and what it personally meant to you in terms of impact and growth?**

My personal motivation as a leader in the semiconductor industry is to drive innovative solutions and collaboration with the objective to enhance our everyday convenience (e.g., AI Smart Voice and Wi-Fi Audio Solutions/ Hearing Aid Solutions Realtek's Bluetooth RTL8773D), promote sustainability (e.g., energy efficient products), and facilitate seamless connectivity. At Realtek Semiconductor Corporation, a world-leading IC provider, we design and develop a diverse array of integrated circuits for connected media, communications networks, computer peripherals, multimedia, and Smart Interconnect applications. These values guide my approach to unite diverse stakeholders, foster collaboration (here in Singapore, we are in the process of collaborating with local research institutions), and create a shared vision. A prime example of this was Realtek's 10-year anniversary celebration last year, where we convened government officials, research institutions, and the entire semiconductor value chain—including foundries, OSAT, and manufacturing partners. This event not only strengthened our relationships but also highlighted our collective commitment to innovation and sustainability, reinforcing my belief in the power of collaboration to drive meaningful impact and industry growth.

Defining Unity in Action **– In your experience, how do you define unity within the electronics sector, and can you recount a moment when this unity led to a breakthrough achievement? What did that moment signify for you and your organization?**

In my experience, unity within the electronics sector means fostering a collaborative spirit where diverse teams work toward a common goal, leveraging each member's strengths and insights.

Fostering Innovation Through Collaboration **– How do you cultivate an environment that encourages innovation through collaboration? Can you discuss a particular initiative where your leadership directly contributed to a successful outcome, and what insights you gained from that experience?**

To cultivate an environment that encourages innovation through collaboration, I emphasize openness and respect, recognizing that everyone has something unique to contribute. By fostering a culture where diverse ideas are valued, team members feel empowered to share their perspectives, leading to creative solutions. A particular initiative that exemplifies this was a cross-departmental brainstorming session at Realtek, where we invited input from engineers, business leaders, human resource and marketing professionals. By creating a safe space for dialogue, we generated a wealth of ideas that ultimately led to the development of a successful project.

Lessons from Challenges **– Reflecting on your journey, what challenges have you faced in promoting collaboration and unity, and how did overcoming these challenges shape your leadership style? Can you provide an example where this learning led to a successful partnership?**

Throughout my journey, I've faced challenges in promoting collaboration and unity, particularly in cross-cultural settings and across functional areas. Working in Washington DC, Taiwan, the Netherlands, and Singapore highlighted the importance of cultural sensitivity in driving projects forward. I learned that understanding and respecting diverse perspectives is crucial for building trust and facilitating effective communication. Additionally, bringing together engineers, business leaders, academia, students, and marketing professionals required me to adapt my communication style, ensuring that I spoke the language each group could relate to.

A notable example of overcoming these challenges occurred during a multinational project where I convened a diverse team to develop a new project. By creating an inclusive environment that encouraged open dialogue, we not only addressed cultural nuances but also leveraged each member's unique expertise. This collaboration led to a successful partnership that resulted in an innovative initiative, reinforcing my belief that embracing diversity and fostering unity are key to effective leadership and project success.

Impact of Collaboration on Industry Growth **– What role do you believe collaboration plays in the overall growth and evolution of the semiconductor industry? Can you share a specific case study that illustrates this impact, and what it taught you about the power of working together?**

Collaboration plays a crucial role in the growth and evolution of the semiconductor industry, as it harnesses the diverse insights and expertise of every player—from interns and IC designers to senior engineers and end customers. A compelling case study illustrating this impact occurred during a product development initiative at Realtek. We established a collaborative atmosphere that encouraged transparent discussions across all levels of the organization, inviting input from everyone involved. This inclusivity not only drove our product forward but also sparked innovative ideas that shaped our future projects. The experience taught me that fostering a culture of collaboration leads to a richer exchange of ideas, ultimately enhancing creativity and responsiveness to market needs. By valuing every voice in the process, we create an environment ripe for innovation and continuous improvement, essential for sustaining growth in our rapidly evolving industry.

Advice for Emerging Leaders – What insights would you offer to emerging leaders in the semiconductor sector about the importance of unity and collaboration? Could you share a personal story that highlights a pivotal moment in your leadership journey related to this theme?

To emerging leaders in the semiconductor sector, I emphasize the importance of unity and collaboration by fostering an environment of active listening and open-mindedness. Creating a space where all team members can share their ideas and learn from one another—regardless of corporate hierarchy—enriches our collective knowledge and drives innovation. A pivotal moment in my leadership journey occurred during a cross-functional project where diverse perspectives were crucial. I encouraged an open forum for discussions, which led to unexpected insights that ultimately shaped our initiative's success. This experience reinforced my belief that collaboration, grounded in mutual respect, not only enhances team dynamics but also paves the way for groundbreaking solutions in our industry.

REALTEK SINGAPORE

HOW AMS OSRAM'S CEO, MR. ALDO KAMPER, IS SHAPING THE FUTURE OF TECHNOLOGY IN THE SEMICONDUCTOR INDUSTRY'S NEXT WAVE OF INNOVATION

How do you foresee the semiconductor industry evolving over the next 5 to 10 years and the role of your company in shaping the future of the industry?

The semiconductor industry is poised for significant growth, driven by advancements in various sectors. The demand for semiconductors will continue to rise, as they become even more integral to emerging technologies such as Augmented Reality (AR), Artificial Intelligence (AI), and advanced healthcare solutions.

Our company is positioned to play a decisive role in shaping this future. By addressing key growth areas, we are not just participating in the industry's evolution – we are actively driving it. For instance, our contributions to AR/VR technology are crucial. Our technology helps redefine the interface between humans and

devices, fundamentally transforming how people interact with machines. Moreover, our advancements in wearable healthcare technology will revolutionize personal health monitoring, effectively putting a doctor's office on every wrist. And in the automotive sector, we are redefining the function of lighting, turning front lights into projectors and enabling rear lights and windows to serve as dynamic displays.

By delivering cutting-edge solutions, we will help shape a future where semiconductors are not just components but enablers of innovation across multiple domains.

What are the key innovations your company is currently focusing on in semiconductor technology and how do these innovations address the current needs and future demands of the industry?

ams OSRAM is unique in the opto semiconductor industry because we provide emitters, driver ICs and sensors. We utilize our innovation power to produce technology breakthroughs in all those areas, both as individual components but also linked together in modules or solutions, for major growing future markets like Automotive, Robotics & Automation, both in Consumer applications as well as in industry and production. Also, the area of Medical, Health and Wellbeing is a strong growth driver.

How important are partnerships and collaborations in driving innovation and addressing industry challenges?

Partnerships are essential in today's semiconductor ecosystem to explore new paths and push the boundaries of what is technologically feasible. We often supplement our R&D activities with government-funded programs and work closely with various companies in the industry and the research community. We also collaborate with universities, institutes, and companies on cross-disciplinary projects. Some aspects of product development may also be outsourced to third party R&D partners. The innovative strength of our teams is reflected in the number of patents, copyrights, trademarks, trade secrets and documented know-how that we protect to secure our differentiated leadership position. End of last year we held approximately 5,700 patents in various jurisdictions, totaling approximately 14,000 issued and pending patents worldwide.

Can you highlight any recent partnerships or collaborations that have been particularly successful in advancing semiconductor technology?

A good example of this is a success story from the automotive segment: our laser diodes for lidar modules that I mentioned above. These modules are important for safe, automated driving. With new technologies like this, it is important to work together with the world's leading companies. That is why we are proud to have been singled out by Robosense, a leading Chinese supplier of lidar systems, as one of its most important partners. Robosense's lidar solutions can already be found in 25 vehicle models on the road. The company has won design wins in 65 vehicle models.

What leadership qualities do you believe are most essential for driving technological breakthroughs in this sector?

First, in a fast-paced innovation environment, business decisions and responsibilities must be made close to the business. That is why the new Management Board transferred full business responsibility including operations and innovation to the business units shortly after taking office last year. Second, this goes hand in hand with trusting and empowering your people – two principles that are part of our corporate values. Third, and most importantly, you need to foster a culture of open-mindedness and collaboration within the organization. Diverse teams that can work together in an open, creative environment deliver the best results and can create something meaningful new.

UNLOCKING THE FULL POTENTIAL OF A DIVERSE WORKFORCE FOR SINGAPORE'S MANUFACTURING SECTOR

A recent report revealed that 81% of employers in Singapore's industrial sector face difficulties in finding qualified candidates for open positions. This presents a challenge for the sector as it works towards goals set out in Singapore's Manufacturing 2030 vision. To address this, a strong talent development pipeline is needed - not only to grow our talent pool but also retain the critical skills and knowledge that the industry needs to move forward.

Mid-career job seekers with the right profiles could fill these gaps. They have come under the spotlight in recent months, with the Singapore government launching its SkillsFuture Level-Up programme targeting mid-career professionals aged 40 and above. While some of these individuals may not have the exact manufacturing background that our sector is known to look for, they can bring valuable fresh insights and transferable soft skills like problem-solving abilities that remain applicable to our setting.

Identifying these individuals with the suitable attributes is the first step. Companies must act proactively to enable their integration back into the workforce, and invest in their development to unlock their full potential.

Bridging programmes to enhance technical skills

For a start, tailored bridging programmes that prioritise the technical skills needed to help employees transition quickly into their new roles would be critical. Companies can also leverage government initiatives: Workforce Singapore provides Career Conversion Programmes (CCP) that assist mid-career job seekers in acquiring new skills and transitioning to sectors with promising long-term opportunities.

GF has been a strong supporter of CCP since 2016. To date, we have successfully employed 146 employees who embarked on mid-career switches under the CCP and of which, close to 20% have progressed to higher job levels within the organisation. To support the effective onboarding of these employees who come from mid-level backgrounds, we redesigned the job scopes and put in place structured training programmes to bridge knowledge gaps within the first six months of the job. They are also paired with experienced employees to help them better assimilate into the existing organisational culture, with many mentors continuing to stay on as advisors after the initial onboarding.

Beyond the CCP, peer coaching and mentoring is also a priority across the organisation to build a culture of collaborative learning. We have developed internal training programmes to help people managers learn the art of coaching and employees are able to easily reach out to their desired mentors via a new feature in our human resource system. In fact, we have seen a 25% increase in employees taking up classes related to coaching and mentoring in 2024.

Family-friendly policies to welcome returning segments of the workforce

Furthermore, pivoting to a new industry or re-entering the workforce after some time can be a daunting experience, especially for women who make up a large proportion of mid-career jobseekers. In fact, 63% of women have contemplated or taken a career break, according to a recent Singapore Business Federation survey. Organisations have a responsibility to implement inclusive policies and establish support networks to help these women manage return-to-work challenges. These challenges could

include balancing family responsibilities, or adjusting to new work environments.

At GF, we have implemented various family-friendly policies, including extended maternity leave, lactation rooms and caregiving support, to help our working mothers balance family responsibilities with their career aspirations. Creating resource groups and other affinity networks can further enhance a sense of belonging, especially among peers who share similar experiences. For example, GF's GlobalWomen is our largest employee resource group (ERG) dedicated to supporting female professionals and allies in their personal and professional growth. The Singapore GlobalWomen chapter has more than 700 members today. Our efforts in building an inclusive workplace have earned GF numerous industry accolades, including the 2023 Employee Experience Awards (Gold Award in Diversity and Inclusion). We are also proud to be recognised as an Equality 100 Leader for LGBTQ+ Workplace Inclusion, with a top score in the Human Rights Campaign's 2023-2024 Corporate Equality Index (CEI).

Encouraging a culture of continuous learning and upskilling

Support for mid-career job seekers should also extend beyond onboarding to their entire career journey. At GF Singapore, we continue to strengthen our talent pipeline with workplace innovations that build a culture of continuous learning. Our wide array of platforms available for online learning and new certification, alongside dedicated programmes for people managers, are just some of the many types of resources available for all our employees. These initiatives feed into our goal of inspiring employees to take ownership of their own learning and fostered a positive work environment, leading to high job satisfaction among our employees.

We believe that expanding the pool of manufacturing talent involves more than just recruiting suitable mid-career job seekers from outside our sector and integrating them into their roles. It is equally important to prioritise their continuous upskilling as part of ongoing employee training, ensuring that they truly contribute to strengthening Singapore's manufacturing talent pipeline.

GlobalFoundries®

By, **Janice Lee**, Vice President Human Resources, GlobalFoundries Singapore

APPLIED MATERIALS AND NATIONAL UNIVERSITY OF SINGAPORE EXPAND SEMICONDUCTOR RESEARCH LAB

New phase will include larger, more advanced cleanroom, establishment of a Professorship at NUS, and new programmes for talent development

Phase 2 of the Applied Materials — NUS Advanced Materials Corporate Laboratory was launched on 24 October 2024 by Deputy Prime Minister Heng Swee Keat (middle) as the Guest-of-Honour. From left to right: Mr Brian Tan, Regional President (South East Asia), Applied Materials; Dr Satheesh Kuppurao, Group Vice President, Applied Materials; Mr Heng Swee Keat, Deputy Prime Minister and Chairman, National Research Foundation; Mr Hsieh Fu Hua, Chairman, NUS Board of Trustees; and Professor Tan Eng Chye, President, NUS.

Applied Materials South East Asia Pte. Ltd. and the National University of Singapore (NUS) are furthering their collaboration to bring advanced semiconductor research capabilities and talent development opportunities to Singapore. Supported by the National Research Foundation (NRF) under the Research, Innovation and Enterprise 2025 (RIE2025) plan, the Applied Materials-NUS Advanced Materials Corporate Lab – established in 2018 and located on the NUS Kent Ridge campus – will be expanded with state-of-the-art semiconductor process equipment in a larger, more advanced cleanroom. In addition, Applied Materials and NUS are collaborating on programmes designed to strengthen Singapore's talent pipeline.

Mr Heng Swee Keat, Deputy Prime Minister and Chairman of NRF, was the Guest-of-Honour at a ceremony held today at NUS marking the new phase of the Corporate Lab. Guests from the industry, local research ecosystem and government agencies attended the event.

Researchers from Applied Materials and NUS work jointly in a semiconductor cleanroom laboratory (left) and chemistry laboratory (right) at NUS.

"When NUS and Applied Materials first established the Corporate Lab six years ago, we laid the foundation for a collaboration that has since yielded remarkable success," said NUS President Professor Tan Eng Chye. "Several of the innovations developed here have progressed from the research stage to the scale-up phase, paving the way for

real-world applications that can benefit society. We are very excited to embark on a new chapter in our collaboration with Applied Materials to further advance semiconductor science and technology and inspire the next generation of innovators who will push the envelope and break new ground in this significant field."

"The Advanced Materials Corporate Lab at NUS is a prime example of how industry-academia collaboration can accelerate the discovery and transition of innovations into commercial applications," said Dr Satheesh Kuppurao, Group Vice President of Business Development and Growth, Semiconductor Products Group at Applied Materials, Inc. "Our joint work has resulted in numerous patents related to chemistry, semiconductor process and hardware design solutions, along with several sponsored scholarships. Applied Materials is excited to build on our success with NUS and bring enhanced semiconductor research and talent development opportunities to Singapore."

Deputy Prime Minister Heng Swee Keat (front row, right) touring an exhibition highlighting cutting-edge innovations in advanced materials, microelectronics, and other breakthrough technologies.

Hosted at the College of Design and Engineering and the Faculty of Science at NUS, the Applied Materials-NUS Advanced Materials Corporate Lab offers world-class, multi-disciplinary R&D capabilities that span applied chemistry, materials science and microelectronics process engineering. The goal of the Corporate Lab is to accelerate discovery of new materials that can be quickly transferred into commercial applications for manufacturing future generations of semiconductors.

The second phase of the Corporate Lab will elevate the well-established microelectronics research capabilities at NUS to new heights by fostering innovation, accelerating the development of cutting-edge technologies and expanding interdisciplinary collaboration. It will include a new cleanroom in NUS with state-of-the-art materials synthesis and characterisation capabilities. Utilising these enhanced capabilities, Applied Materials and NUS will focus on developing industry-scale solutions to complex semiconductor manufacturing challenges, with an emphasis on integrated processes and interface engineering.

Mr Brian Tan (left), Regional President (South East Asia), Applied Materials, presenting a cheque to NUS President Professor Tan Eng Chye (right) for the establishment of the new Applied Materials Professorship at NUS. The aim is to attract experts in semiconductors, materials science and other technology fields.

Along with the new phase of the Corporate Lab, the Applied Materials Professorship has been established at NUS to attract experts in semiconductors, materials science and other technology fields. In addition, the enhanced capabilities at the Corporate Lab will introduce new educational and talent development opportunities for undergraduates, postgraduates and professionals in the areas of microelectronics, advanced materials and process engineering. This will ensure the University's sustained academic leadership within these critical fields and contribute to Singapore's overall economic growth and development.

For Applied Materials, the latest phase of its collaboration with NUS is part of the company's "Singapore 2030" plan to strengthen its manufacturing capacity, R&D capabilities, technology ecosystem partnerships and workforce development in Singapore.

APPLIED MATERIALS make possible

NUS National University of Singapore

FOSTERING UNITY IN THE GLOBAL SEMICONDUCTOR ECOSYSTEM:

CLEANTECH SERVICES' COLLABORATIVE VISION

How do you envision the role of CleanTech Services in fostering unity within the semiconductor ecosystem, both in India and globally?

CleanTech Services (CTS) envisions its role as a unifying force within the semiconductor ecosystem by fostering collaboration, creativity, and innovation. Built on the principle of bringing industry experts together, CTS aims to deliver next-generation solutions that benefit our customers while promoting shared value across the ecosystem.

Our purpose extends beyond business—we seek to positively impact the lives of our employees, employers, and partners by fostering a sustainable environment for growth. Through responsible leadership, CTS is committed to cultivating empathy, trust, and transparency. By encouraging learning, knowledge sharing, and open collaboration with our customers and partners, we aim to drive innovation, elevate the ecosystem in India and globally, and contribute to the long-term success of the industry.

Can you discuss how partnerships, such as those with Cyclect Holdings and QAM Singapore, have contributed to CleanTech's success? What key factors do you believe are essential for successful collaborations in the industry?

Our partnerships with Cyclect Holdings and QAM Singapore have been instrumental in CleanTech's success. Cyclect brings over eight decades of experience in Singapore's semiconductor industry, providing valuable expertise to enhance the efficiency, sustainability, and impact of our projects. QAM, a leader in quality assurance and validation services, ensures that CleanTech delivers the highest standards in semiconductor projects.

These collaborations have allowed CleanTech to offer turnkey solutions with a single point of contact, streamlining processes for our customers. The foundation of these partnerships lies in shared values of empathy, trust, and transparency. By placing complete confidence in each other's expertise, we have been able to deliver exceptional value together. I believe that mutual respect, aligned vision, and open communication are the key factors for any successful collaboration in the industry.

What challenges have you faced in building collaborations within the semiconductor sector, and how have you overcome them? Can you share specific examples?

Building collaborations within the semiconductor or any other sector has some common challenges. I believe that success hinges on three key pillars: mutual respect, trust, and aligning our vision and values. One of the biggest challenges is ensuring all partners share a common goal. For CleanTech, our purpose is clear: to leverage our more than 20 years of experience in Singapore's semiconductor industry and contribute meaningfully to the industry's growth, locally and regionally. When partners understand this shared objective, collaboration becomes more seamless.

Take our partnerships with Cyclect and QAM, for example. We've worked together for over two decades in my previous role, which has created a deep level of trust. What sets this collaboration apart is that we don't just view it as a typical B2B relationship. It's more personal and goes beyond business transactions—we prioritize genuine relationships. Having collaborated for 20 years in my previous roles, I see it as a people-to-people partnership, where trust, respect, and shared values make the collaboration effortless and meaningful, regardless of company size or revenue.

A specific challenge in many collaborations is deciding who should lead the joint venture. However, in our partnerships with Cyclect and QAM, this has never been an issue. The trust we've built over two decades means there is full confidence in CleanTech's leadership, so this question never even arises in our conversations. The mutual respect and shared values we hold ensure that leadership decisions are made naturally and in the best interest of all parties.

How has the support from Enterprise Singapore influenced your ability to connect with other industry leaders and organizations in India? What impact do you see this having on the local semiconductor ecosystem?

Enterprise Singapore (ESG) has been instrumental in facilitating our connections with key decision-makers across the semiconductor industry in India. CleanTech Services deeply values their dedication and hard work in helping us build these relationships. Thanks to their support, CleanTech Services has become a trusted partner for several leading semiconductor companies, which is a significant achievement for us.What truly stands out about ESG's involvement is its hands-on approach. They don't just make introductions; they often feel like an extension of our team. ESG actively helps us follow up on business leads, and we keep them in the loop on key communications with industry leaders. This seamless collaboration has had a positive impact on our ability to forge strong, sustainable partnerships in India's growing semiconductor ecosystem. We believe that with ESG's continued support, we can play an important role in shaping the future of the local semiconductor landscape.

In your opinion, what are the critical elements needed to create a sustainable semiconductor ecosystem in India? How does CleanTech plan to contribute to this vision?

To build a sustainable semiconductor ecosystem in India, several critical elements are essential. These include developing a skilled workforce through targeted training programs, fostering R&D collaboration, establishing advanced manufacturing infrastructure, and ensuring strong government policies that support growth. Additionally, building a resilient supply chain and incorporating sustainable practices are vital for long-term success. Cleantech is committed to contributing to this vision by integrating the expertise of our partners from Singapore and South Korea to help accelerate the growth of the semiconductor ecosystem and position India as a key player in the global market.

We are actively working with two state governments and local industry organizations in India to establish a skilled training centre, which will develop the workforce required for the industry in India and the surrounding region. Furthermore, we are in discussions with our technology partners from South Korea to set up a local manufacturing centre for semiconductor process facility equipment, contributing to the creation of a robust and sustainable semiconductor ecosystem in India.

How do you believe unity among semiconductor companies can accelerate growth and innovation in the sector? Can you share any examples where collaboration led to a significant breakthrough or improvement?

Unity among semiconductor companies is essential for accelerating growth and innovation, especially in India's emerging semiconductor sector, which is still in its early stages. The opportunities in this rapidly expanding industry are beyond the capacity of most companies to handle alone, which makes collaboration crucial for pooling resources and knowledge to meet industry demand while keeping costs in check. Joint innovation becomes the key differentiator, enabling companies to work together without compromising their core principles.

One strong example of this is our collaboration with QAM Singapore. Through our joint venture in India, we provide Third-party Quality Services to semiconductor customers, regardless of their chosen solution provider. This collaboration has allowed us to bring QAM's expertise and resources to India, not only benefiting our projects but also making their resources available to other customers. This open approach supports the industry's growth and elevates the overall quality standards.

What are your long-term goals for CleanTech Services in terms of collaboration and unity within the semiconductor industry? How do you plan to achieve them?

At CleanTech Services, our long-term goals in the semiconductor industry revolve around fostering collaboration, transparency, and trust—key principles of our success. We aim to build strong alliances with like-minded companies, equipment manufacturers, industry associations like SSIA, research institutions, and environmental groups to drive sustainable practices and promote the adoption of greener technologies. A crucial part of our vision is to advocate for environmental standards that will help companies transition to eco-friendly solutions. A key component of our future strategy involves developing next-generation equipment in collaboration with our OEM partners, designed to meet Industry 5.0 standards. This will significantly enhance safety on-site by eliminating high-risk human activities, such as manual gas cylinder changes while improving automation and precision in handling hazardous gases and chemicals. Additionally, by integrating eco-friendly materials and processes, these innovations will help strengthen the regional semiconductor ecosystem and promote more sustainable industry practices.

Furthermore, CleanTech is committed to collaborating with customers to develop customized products and services tailored to their unique needs. By operating on a fully transparent basis, we enable customers to have a clear understanding of cost structures, fostering stronger trust and long-term partnerships. Through these strategies, CleanTech aims to unite the industry around sustainability, drive innovation, and continue contributing to the growth and success of the semiconductor sector.

What advice would you give to emerging semiconductor companies in India regarding the importance of collaboration and unity within the industry?

India's vibrant diversity in culture, language, and business environment presents both unique challenges and immense opportunities for the semiconductor sector. For emerging semiconductor companies, collaboration with complementary partners is crucial for amplifying strengths and mitigating risks. This approach allows for more effective navigation of the dynamic Indian market while unlocking the full potential of the industry.

My key advice would be to prioritize collaboration and unity within the industry. This includes forming partnerships with research institutions and established firms whose expertise complements your own, engaging with government initiatives, and actively participating in knowledge-sharing forums. Collaborating with educational institutions is also critical for building the skilled workforce needed to sustain the industry's future growth.However, it's equally important to choose your partners wisely to safeguard your business and intellectual property. While collaboration is essential, selecting trusted partners who understand your goals can reduce risks. The rules of the game can vary significantly, even within the same industry, so a strategic approach to partnerships can be a key factor in achieving long-term success.In our projects, we need a wide range of facility equipment, while we have the capability to manufacture this equipment in-house, our commitment to collaboration

drives us to partner with leading companies from South Korea and China, such as Hanyang Eng, GST, JIN Solutions, Leaders and Global, Simpure, and Brothers.These companies are experts in their respective fields, providing specialized equipment for gas and chemical systems. By partnering with them, we access their cutting-edge technologies and expertise, allowing us to focus our resources on supporting our customers. This approach enables us to deliver faster, more cost-effective solutions while maintaining the highest standards of quality and safety. I strongly believe that this strategy reduces both costs and lead times, accelerating project completion and enhancing customer satisfaction.

If you were to highlight a specific case study from CleanTech's journey that exemplifies unity and collaboration, what would it be? What lessons can be learned from that experience?

CleanTech's journey is a prime example of how unity and collaboration can drive success, as these values were the very foundation on which the company was built. The organization came together through the mutual trust and professional confidence shared among its founders, setting the stage for continuous growth. This collaborative spirit was rooted in my 24 years of experience in the semiconductor industry, where I noticed significant areas for improvement—particularly in supply chain innovation and the speed of response to industry demands.One key observation from my previous roles was the fragmentation of knowledge across different players in the industry. Many stakeholders held different parts of the puzzle, but a lack of collaboration slowed down progress. To address this, I worked to bring these stakeholders together on common projects, successfully executing several large semiconductor projects across Singapore and Southeast Asia.

The lesson here is clear: collaboration isn't just a buzzword—it's a necessity. By fostering a culture of unity and encouraging knowledge-sharing, we can respond more effectively to industry demands and innovate faster. CleanTech's growth and success have been driven by this philosophy, and it remains a core part of how we operate.

With India positioning itself as a semiconductor manufacturing hub, how do you foresee CleanTech's role in this transformation? What collaborative strategies will you employ to support this growth?

As India positions itself as a key semiconductor manufacturing hub, CleanTech is poised to play a vital role in this transformation. While securing business opportunities is certainly a priority, we are equally focused on giving back to the industry. To support this, we are actively engaging with several state governments to establish skill development centers that focus on critical training, including high-purity welding and the safe handling of hazardous gases and chemicals. These efforts aim to enhance employment opportunities in India's rapidly growing semiconductor sector, and we are open to collaborate with more agencies to create targeted programs for skill development.

Total Gas and Chemical Solutions will be crucial to India's semiconductor ecosystem. Gas and chemicals are the lifeblood of industries like semiconductors, photovoltaics (PV), and displays, and CleanTech's technical experts—armed with more than 25 years of experience—bring world-class knowledge and operational expertise to this domain. Our expertise in the design, installation, and operation of gas and chemical solutions enables us to offer safe, cost-effective, and seamless operations to customers.As India is still in the process of developing standards for the storage and use of hazardous materials, CleanTech aims to collaborate with regulatory bodies to share best practices and help shape local regulations. Additionally, our training programs on best work processes will enhance safety and quality standards, making CleanTech's solutions essential for building a sustainable and globally competitive semiconductor sector in India. Through these collaborative strategies, we are committed to supporting the country's growth as a semiconductor manufacturing powerhouse.

Clean-tech SERVICES PTE LTD

Mujeeb Mundayil
Managing Director of CleanTech Services Pte Ltd

GLOBALFOUNDRIES AND NXP TO DELIVER NEXT-GENERATION 22FDX SOLUTIONS FOR AUTOMOTIVE, IOT AND SMART MOBILE

Building on years of collaboration, this new process technology collaboration will provide power-efficient and secure connectivity solutions for essential consumer and industrial applications manufactured both in Europe and the U.S.

MALTA, N.Y. and EINDHOVEN, Netherlands, October 23, 2024 — GlobalFoundries (Nasdaq: GFS) (GF) and NXP Semiconductors (NASDAQ: NXPI) today announced collaboration to drive next-generation solutions across a range of end markets including automotive, IoT and smart mobile devices. This collaboration leverages GF's 22FDX® process technology platform and global manufacturing footprint to optimize the power, performance and time-to-market of NXP's solutions. GF's 22FDX chips will be manufactured in Dresden and Malta, New York, providing NXP geographically diverse supply for their customers.

The new collaboration, building on the longtime relationship between NXP and GF, will enable NXP to provide more compact and power-efficient solutions while increasing the overall performance of their system solutions. The companies will leverage GF's 22FDX platform, which optimizes performance by dynamically adjusting to the lowest possible voltage, delivering ultra-low power consumption and high performance for the most demanding applications. Purpose-built for intelligence at the edge, 22FDX optimizes energy management to deliver up to 50% higher performance and 70% less power used versus other planar CMOS technologies.

"NXP's innovative portfolio of high-performance solutions is crucial to enabling the essential technologies at the center of our increasingly connected world," said Andy Micallef, executive vice president and chief operations and manufacturing officer at NXP. "GF's 22FDX platform's power efficiency and enhanced performance effectively enables our customers to build the next generation of connected and secure solutions. Additionally, GF's robust manufacturing presence for 22FDX in Germany and the U.S. helps support our goals of having supply control and geographic resilience in our manufacturing base."

"Our close collaboration for over a decade has been a testament to the strength of our shared vision and commitment," said Niels Anderskouv, chief business officer at GF. "As we move forward, we're excited to build on this foundation and further enable NXP's next-generation solutions with high-power efficiency and optimal performance, without customers needing to compromise on either."

The 22FDX platform also maximizes performance per area by integrating digital, analog, RF, power management, and non-volatile memory (NVM) onto a single die. With best-in-class RF connectivity, 22FDX delivers responsive and reliable wireless connectivity for simple and secure connections. Integrated NVM reduces power consumption

and latency while improving security, especially important given the growing memory footprint for Edge AI processors. Through this integration, NXP will create a one-stop shop platform to serve multiple markets while maximizing IP reuse.

With technology qualified for Automotive Grade 1 and 2 applications, 22FDX ensures exceptional reliability in extreme automotive conditions. As part of GF's AutoPro™ solutions, the 22FDX platform includes advanced temperature-resistant capabilities up to 150°C junction temperature, which is critical to ensuring the long-term durability and safety of vehicle electronic systems.

Built on a rich heritage of FDX innovation, GF has a robust portfolio of silicon and product-proven IP for Automotive, Communications, and IoT applications. With a secure, global supply chain, GF has shipped more than 3 billion FDX chips to customers worldwide from Dresden and is now also shipping from Malta, N.Y.

Following the companies' previous joint development of 40nm NVM technology, GF is well positioned to support NXP's next-gen solutions for years to come through its ongoing innovations to its FDX and FDX+ platforms.

About GF

GlobalFoundries (GF) is a leading manufacturer of essential semiconductors the world relies on to live, work and connect. We innovate and partner with customers to deliver more power-efficient, high-performance products for the automotive, smart mobile devices, internet of things, communications infrastructure and other high-growth markets. With our global manufacturing footprint spanning the U.S., Europe, and Asia, GF is a trusted and reliable source for customers around the world. Every day, our talented and diverse team delivers results with an unyielding focus on security, longevity, and sustainability. For more information, visit www.gf.com.

About NXP Semiconductors

NXP Semiconductors N.V. (NASDAQ: NXPI) is the trusted partner for innovative solutions in the automotive, industrial & IoT, mobile, and communications infrastructure markets. NXP's "Brighter Together" approach combines leading-edge technology with pioneering people to develop system solutions that make the connected world better, safer, and more secure. The company has operations in more than 30 countries and posted revenue of $13.28 billion in 2023. Find out more at www.nxp.com.

GlobalFoundries®

KLA SINGAPORE ANNOUNCES SITE EXPANSION, SUPPORTING CUSTOMERS AND OPENING LOCAL CAREER PATHS

As one of the company's fastest-growing operations, KLA Singapore has completed the first phase of a new facility, building its presence as a leading global semiconductor manufacturing and technology hub and, after the planned opening of phase 2 in 2026, expanding the company's local workforce by 30%.

From KLA's first foray in Singapore close to 30 years ago, we have grown in step with the maturing of Singapore's semiconductor manufacturing industry and talent base. We've steadily expanded our operations here over the years to serve both regional and global customers.

Theo Kneepkens, KLA Singapore country president and KLA senior vice president of Global Operations

Designed strategically to address the increasing demand for process control solutions and developed with the most stringent requirements for vibration control and cleanroom protocol, the new facility underscores KLA's commitment to supporting growth of the semiconductor industry in Singapore and globally as well as developing and nurturing local highly skilled technical talent.

Phase 2 structure will add more critical space, bringing the total facility capacity to 420,000 square feet, further expanding cleanroom space as well as KLA's local R&D facilities.

Ranked as a Best Employer of Singapore for consecutive years, the KLA Singapore workforce — which includes engineers, research scientists and problem-solvers — develop and manufacture leading-edge technologies to build products better, faster and cheaper to help drive customers' success.

KLA Advance asked some longtime employees to talk about their careers within the company:

Our work in Singapore developing leading-edge technologies is important because our facilities contribute to the long-term impact and success for customers and KLA alike – all while we advance our own professional skills.

Vincent Foo, senior manager, Asia Facilities

Vincent Foo, Senior Manager, Asia Facilities

In just nine years, Vincent's role at KLA Singapore has grown from a local individual contributor to a senior manager with regional responsibilities.

After working as an engineer for a microelectronics company, Vincent joined KLA Singapore in 2015 and has grown into roles that include cleanroom design and responsibility for construction at sites in Asia, maintenance, engineering, special projects and the company's real estate transactions in Singapore and South Korea.

Vincent is motivated by contributing to his team's success, which he says advances KLA and the wider semiconductor industry. He finds satisfaction in applying his knowledge and skills to every initiative and constantly learning.

> ***Alignment among many very interesting and smart people with their own ideas and specialties helps us accomplish great things. On customer visits, it's gratifying to feel that people are happy for KLA's support and that our solutions deliver results.***
>
> *Laurent Hermans, ICOS software and product engineering manager, KLA Singapore*

Laurent Hermans ICOS Software and Product Engineering Manager, KLA Singapore

Laurent joined KLA as a 3D vision engineer in 1999, contributing his experience with leading-edge technology to help make a tangible impact on the semiconductor industry.

As Vision Team lead, he worked closely with customers and KLA's field engineers and managers. By working in a global company that invents impactful technologies, Laurent helped customers meet their challenges in an evolving semiconductor industry – and positioned himself on a course for career growth.

Laurent visited Singapore frequently. He eventually relocated to Singapore as software manager to be closer to the company's customers and to set up the local R&D team. Laurent collaborated with multiple product divisions in Singapore and abroad, which he explains is key to supporting customers.

> ***You can't find a culture quite like what I have experienced in KLA. Active collaboration is important, especially in an environment where people are constantly working on the edges of deep science.***
>
> *Huang Xiaohua, manufacturing design engineer*

Huang Xiaohua, Manufacturing Design Engineer

Xiaohua joined KLA Singapore as an associate test engineer in 2006. From the start, Xiaohua learned new skills that positioned her to take on challenging projects that expanded her responsibilities and sped career growth.

Now a manufacturing design engineer since 2011, Xiaohua supports manufacturing team on the technical issue and as well as continuous improvement and new product introduction projects. Her mentors and peers are a constant source of encouragement.

It's this KLA's team-oriented mindset, coupled with Xiaohua's passion for engineering and technologies, that keeps her motivated.

"Whether you're an optics, systems, electrical or mechanical engineer, every individual plays an important role in designing solutions that transform the future," she says. "You will continue to learn and grow professionally."

Explore a career in Singapore and globally on KLA's website: **www.kla.com**

MICRON CHIP CAMP RETURNS FOR THE SECOND YEAR, CULTIVATING INTEREST IN STEM AMONG FEMALE STUDENTS

In collaboration with Science Centre Singapore, Micron hosted the second edition of Micron Chip Camp on June 12-14

Singapore, Jun 12, 2024 — Micron Technology, Inc. and the Micron Foundation have partnered with Science Centre Singapore to host the **second edition of Micron Chip Camp** on June 12-14, while supporting the national agenda to boost women's participation in science, technology, engineering, and math (STEM) and the company's commitment to increasing access to STEM education for students. Following last year's inaugural program, this year's Chip Camp for girls aims to spark their interest in STEM through engaging activities and create a supportive environment for them to explore careers in this field. By creating a dedicated space for them to explore this exciting field, Micron aims to break down misconceptions and inspire the next generation of female innovators in semiconductor technology.

This engaging three-day program offered hands-on STEM (science, technology, engineering, and math) activities related to semiconductor manufacturing and engineering to approximately 40 female students from around 20 secondary schools and high schools islandwide. During the first two days, held at Science Centre Singapore, students learned about topics such as binary and logic gates, memory chip fabrication, microcontrollers, and coding through exciting activities like DIY UV curing keychains and kitchen lithography. They also gained firsthand insight into careers in the semiconductor industry with a field trip to Micron's fabrication plant on the third day, where they had the opportunity to learn about clean rooms, nanotechnology, and explore the capabilities of generative AI tools.

"The Micron Chip Camp is a signature program sponsored and funded by the Micron Foundation, which builds on Micron's mission to enrich life for all by supporting our communities and increasing access to STEM education, where we work tirelessly to provide equitable opportunities for underrepresented groups and create lasting social impact.

This camp is more than just a learning experience; it is a chance to see the impact of STEM in action and to envision a future where participants can be a part of that impact. As they embark on this adventure, I hope they will remember that each of them has the potential to change the world with their ideas and innovations," said Cher Whee Sim, vice president of People Strategy, Technology, and Talent Acquisition at Micron Technology, at the opening ceremony.

POWERING THE TECHNOLOGY TRANSFORMATION IN SINGAPORE

Koh Chiap Khiong, CEO (Singapore & Southeast Asia), Sembcorp Industries shares on the trends shaping the energy sector, the growth of the digital economy, and how Sembcorp is poised to address the rising energy demands

Through an acquisition of various subsidiaries of the Gelex Group, Sembcorp will add 245MW of operational renewable wind, solar and hydropower assets to its current portfolio in Vietnam

Southeast Asia is poised to become the fourth-largest economy by 2030[1], with a growing digital economy driven by significant investments in data centres and energy-intensive industries such as semiconductor manufacturing. Singapore, which offers robust infrastructure, secure energy supply and a stable operating environment, is well-poised to play a pivotal role in supporting the technology transformation led by these industries. Sembcorp, a leading Asian energy player with an established renewables portfolio, is strategically positioned to meet the growing energy demand from this transformation with our comprehensive solutions.

Singapore: An Attractive Hub for High Growth Industries

The rapid growth of digital technologies and cloud computing has fuelled a surge in demand for data centres in Singapore.

Singapore's strategic location at the heart of Southeast Asia, combined with its world-class infrastructure and favourable regulatory environment, makes it a coveted destination for data centre investments. Its proximity to major markets, robust fibre optic network and extensive undersea cables, ensures low-latency connectivity and optimal data transfer speeds. The stable political environment and strong diplomatic relations provide a secure and

reliable operating landscape. As a neutral and attractive hub, several global data centres have established their presence here. In the next few years, Singapore aims to add at least 300MW of data centre capacity, with 200MW allocated to operators who use green energy options.[2]

The semiconductor manufacturing industry supports the growth of data centres through its technology innovations. Singapore is a global leader in semiconductor manufacturing, with nine out of the top 15 semiconductor firms already present here, including Micron and Siltronic. Singapore's government industrial planner, JTC Corpora-

Sembcorp Solar Singapore recently completed a solar carport project for Micron Singapore at their North Coast facility

tion, is preparing 11% more land in Singapore's wafer fabrication parks[3] in a bid to attract more top semiconductor giants and ride the artificial intelligence wave.

Growing Demand from Energy-intensive Industries

As Singapore strengthens its position as a global data centre and manufacturing hub, the associated energy challenges become more pressing. Intensive cooling systems are required to maintain optimal server temperatures due to Singapore's hot and humid climate. As server densities increase due to land constraints, the strain on the power grid intensifies.

The interconnectedness of data centres and semiconductor manufacturing further exacerbates energy demand. The Energy Market Authority estimates a peak demand of 7GW to 10GW[4], driven largely by these sectors.

Diversifying for Security, Decarbonising for Sustainability

Singapore remains heavily reliant on natural gas, which currently accounts for about 95% of its electricity generation. This reliance poses challenges for high growth and energy-intensive industries striving to meet their business needs and sustainability goals.

To meet this pressing demand for energy security and transition, Singapore is exploring avenues to diversify its energy mix. It has doubled its solar power deployment since 2021 to reach over 1GWp in 2023. The nation targets to import up to 4GW of low-carbon electricity from neighbouring countries by 2035, strengthening the regional energy ecosystem. To accelerate decarbonisation efforts, Singapore has outlined a hydrogen strategy to develop a domestic hydrogen ecosystem and plans to tap on hydrogen blends in the natural gas grid to reduce carbon emissions.

Recognising the challenges posed by rising energy demand, the government has introduced several initiatives to promote energy efficiency and sustainable practices in the data centre industry.

One key initiative is the Green Data Centre Roadmap, which focuses on promoting green energy deployments to minimise the carbon footprint of data centres. The pilot Data Centre – Call for Application exercise forms part of Singapore's broader efforts to encourage the deployment of lower-carbon data centres, ensuring that the country's digital infrastructure remains competitive while contributing to global sustainability goals.

Sembcorp: The Trusted Partner in Singapore's Transition Story

In this evolving landscape, Sembcorp is uniquely positioned to meet Singapore's growing energy demands. As the largest renewables player in Singapore contributing to over half of the nation's solar energy target, Sembcorp offers a comprehensive suite of energy solutions that include both natural gas and renewable energy options. This dual capability provides companies with the flexibility to power their operations effectively and sustainably.

Sembcorp's leadership in natural gas is critical to Singapore's energy transition. As one of the largest importers of natural gas into Singapore, Sembcorp plays an indispensable role in ensuring energy security and affordability. Natural gas remains a cornerstone of Singapore's energy strategy, expected to meet more than half of the country's power generation needs by 2035. Sembcorp's strong positioning in the natural gas market allows it to offer long-term contracts and decarbonisation solutions to customers.

Through its renewable energy solutions and active partnerships in regional power imports and low-carbon alternatives, Sembcorp is growing its capabilities to provide customers with green energy transition options to meet their sustainability goals. In 2023, Sembcorp received conditional approval to import 1.2GW of renewable power from Vietnam to Singapore and is in discussions to import 1GW of low-carbon electricity from Sarawak. These initiatives are part of the company's broader strategy to diversify energy sources and support Singapore's transition to a low-carbon economy.

Sembcorp's leadership in the energy sector is underscored by its success in securing long-term power purchase agreements with major players such as Equinix, ST Telemedia Global Data Centres, Micron, GSK and Singtel. These agreements reflect the trust in Sembcorp's ability to deliver reliable and sustainable energy solutions.

Towards A Secure and Responsible Energy Transition

As Singapore's economy continues to be powered by the fast-growing digital and high-tech manufacturing industries, the need to balance energy security with responsible transition becomes increasingly critical. Natural gas remains an essential fuel source to meet Singapore's growing energy demands, and Sembcorp plays a vital role in ensuring a reliable and secure supply. Underpinned by its commitment to drive the diversification and decarbonisation of Singapore's energy supply, Sembcorp will continue to invest in its renewables growth and explore low-carbon solutions, to enable a responsible transition towards a sustainable future.

[1] World Economic Forum: How ASEAN is building trust in its digital economy

[2] EDB: Singapore to expand data centre capacity by at least one-third, pushes for green energy use

[3] CNA: Singapore prepares more land to woo semiconductor giants looking to ride AI wave

[4] EMA: Request for proposal to build, own and operate new generation capacity

SIN CHEW'S EXCELLENCE IN DRIVER SAFETY:

LEVERAGING AI-ENABLED TECHNOLOGY

Sin Chew has recently been honored with the prestigious Workplace Safety and Health Awards 2024 organised by the Workplace Safety and Health Council on 30 July 2024, recognizing the company's commitment to innovation and safety in the transportation sector. This award highlights the successful implementation of AI-enabled technology across Sin Chew's fleet, significantly enhancing driver safety, operational efficiency, and compliance with Workplace Safety and Health (WSH) standards.

In late 2022, Sin Chew made a strategic move to advance road safety by adopting an AI-enabled safe driving management system. This state-of-the-art technology has been deployed across 100% of the company's vehicles, embedding advanced dash cams that monitor driver behavior in real-time, 24/7. The system is capable of detecting critical events such as hard braking, speeding, distracted driving, and even signs of fatigue or drowsiness. Upon identifying any risky behavior, the technology provides immediate notifications to drivers, enabling prompt corrective actions. Moreover, the system facilitates hands-free communication between drivers and controllers, minimizing distractions and enhancing safety on the road. Additionally, the technology generates comprehensive reports for fleet managers, offering valuable insights into driving patterns and areas requiring improvement.

The decision to implement this technology was driven by a strong commitment to enhancing driver safety, reducing accident rates, and ensuring compliance with stringent safety regulations. Since its deployment, the results have been nothing short of transformative. Sin Chew has report-

ed an 80% reduction in potential incident causes, particularly those linked to distracted driving. This significant improvement has not only enhanced driver safety but also led to substantial cost savings by reducing repair costs, lowering insurance premiums, and minimizing operational downtime.

Mr. Kumaran, General Manager and Workplace Safety and Health Officer at Sin Chew, emphasized the positive impact of the technology, stating, “The real-time monitoring and proactive alerts have significantly improved our safety performance, especially among our senior drivers. Initially, there was some resistance due to the challenges of adapting to new technology. However, through hands-on training and clear communication about the system’s benefits, our team has embraced it, fostering a culture of accountability and safety. The advanced analytics provided by this technology allow us to make data-driven decisions that continually enhance our safety standards.”

The technology has also been well-received by the drivers themselves. William, a driver who has been using the system for over a year, remarked, “This technology has made my job safer and more efficient. The real-time monitoring keeps me aware of my driving habits, helping me improve my overall performance. The hands-free communication with controllers is a game changer, allowing me to focus on the road without distractions. The proactive alerts that notify me of potential dangers have been particularly helpful in preventing accidents.”

The adoption of this AI-enabled system has not only led to a decrease in incidents but has also strengthened the safety culture within Sin Chew. Employees are now more engaged in adhering to safety protocols, and the detailed reports generated by the technology have been instrumental in identifying trends and implementing targeted safety initiatives. These improvements have contributed to Sin Chew's recognition with the WSH Tech Awards 2024, underscoring the company’s leadership in WSH performance.

Given the significant benefits experienced, Sin Chew’s adoption of this technology serves as a compelling case for other companies in the industry to follow suit. The technology offers a comprehensive solution that goes beyond enhancing safety; it also improves operational efficiency, reduces costs, and fosters a stronger culture of accountability.

As Sin Chew continues to invest in innovative technologies, the company remains committed to creating safer roads and better working conditions for its drivers. The recognition received through the Workplace Safety and Health Awards 2024 is a testament to Sin Chew's dedication to safety and innovation, setting a benchmark for others in the industry.

Experience the difference in quality, reliability, and sustainability with Sin Chew Woodpaq—your one-stop logistics solution. For more information, visit our website at **www.sin-chew.com.sg**.

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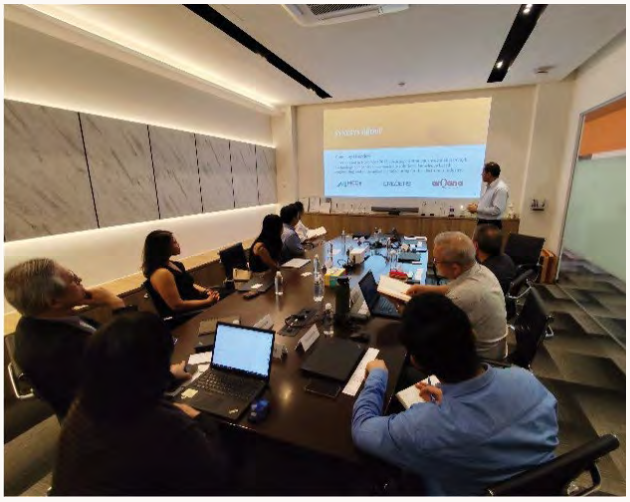
Protecting & Positioning Businesses

SYNESYS TECHNOLOGIES:

PIONEERING INNOVATION IN RF AND POWER ELECTRONICS



Founded in 2017, SYNESYS Technologies Holding is a key player in the electronics industry, with a group of companies including MEDs Technologies, arQana Technologies, and CREIDEAS Technologies. SYNESYS focuses on strategic investments in high-tech firms that deliver advanced engineering, connectivity solutions, and value-added manufacturing services. Headquartered in Singapore, SYNESYS drives innovation in RF (Radio Frequency) and power electronics through its flagship company, MEDs Technologies.

MEDs Technologies, co-founded by Mr. Tony Chia and Mr. Chan Kien Teck, has been a leader in RF and power electronics solutions for over 27 years. Its commitment to developing cutting-edge technologies for defense, space, and other industries is supported by in-house R&D and manufacturing capabilities. MEDs offers end-to-end product development, from chip design to assembly, and specializes in high-reliability solutions for harsh environments.

One of MEDs' standout services is its Multiple Projects Wafer (MPW) platform, which enables startups, design houses, and institutions to share wafer fabrication costs. This service lowers financial barriers for companies testing new technologies, promoting R&D and encouraging innovation in the semiconductor industry. MEDs' rapid product development capabilities, focusing on miniaturization and SWaP-C (Size, Weight, Power, and Cost) optimization, make it a trusted partner for companies looking to accelerate their time-to-market.

SSIA's Visit to SYNESYS Technologies: Strengthening the Ecosystem

On October 2, 2024, the Singapore Semiconductor Industry Association (SSIA) visited MEDs Technologies as part of

its ongoing efforts to engage with key industry players and strengthen the local semiconductor ecosystem. During the visit, discussions centered on the role MEDs can play in empowering small and medium-sized enterprises (SMEs) in Singapore. SSIA aims to support SMEs in specialized areas like intellectual property (IP) development and Fabless IC production, helping them tap into the growing demand in the region.

MEDs is actively contributing to this vision by offering services like the MPW platform, which allows SMEs and startups to test their technologies without high upfront costs. This approach fosters innovation and supports the growth of smaller companies in Singapore, including the Southeast Asia Region's semiconductor industry.

Building Talent and Enhancing Brand Presence

Another key topic during the SSIA visit was the need to build a robust talent pipeline for the semiconductor industry, especially in RF and power electronics. Both MEDs Technologies and SSIA are committed to nurturing local talent and promoting career opportunities within these specialized fields. This will help Singapore maintain its position as a global leader in advanced electronics and semiconductor technology. Additionally, the visit highlighted the importance of enhancing MEDs' brand presence, both locally and regionally.

Conclusion

SYNESYS Technologies Holding, with MEDs Technologies at its core, is driving innovation in RF and power electronics while playing a pivotal role in strengthening Singapore's semiconductor ecosystem. The SSIA's visit accentuated the importance of collaboration and talent development, ensuring that SYNESYS and MEDs continue to lead the industry into the future.

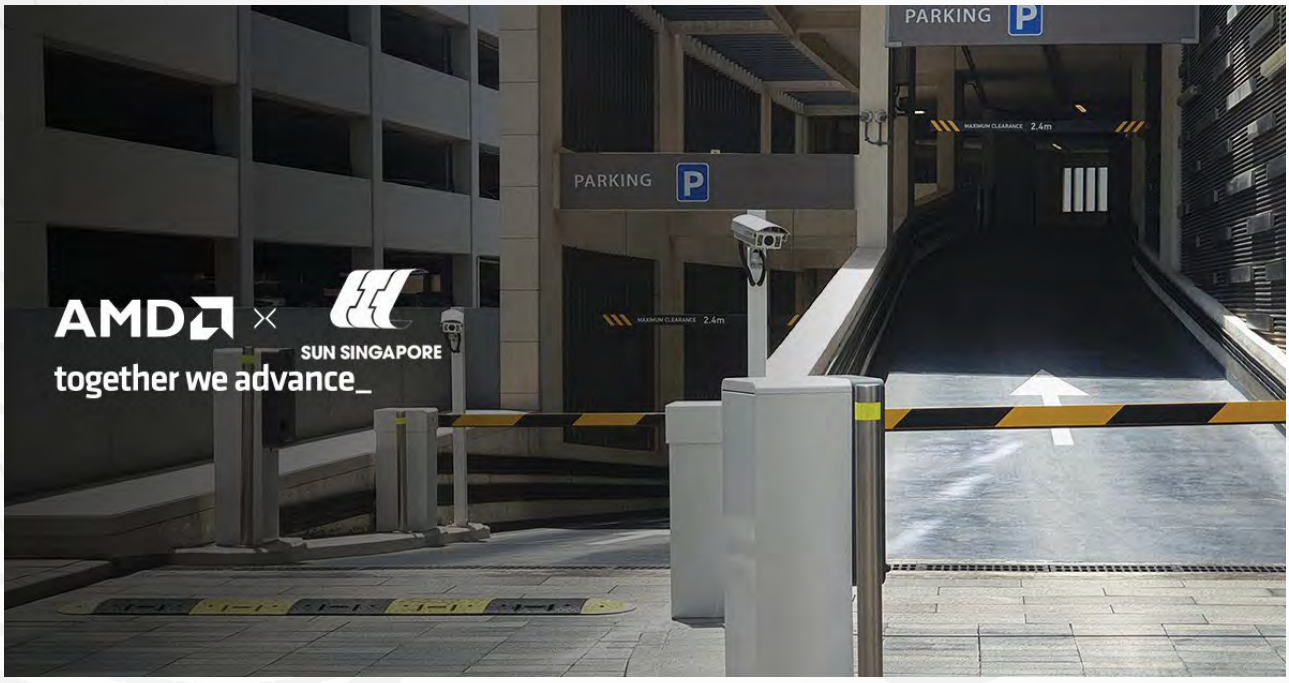
SYNESYS TECHNOLOGIES
MEDs TECHNOLOGIES CREDEAS arQana TECHNOLOGIES

Technology Enabling Life

Technology for creating semiconductors is technology that makes dream products real

Shockingly groundbreaking products –
this is what semiconductor advancements bring.
Our technology produces equipment to
manufacture semiconductors,
and it makes wonders real.

TEL TOKYO ELECTRON



PARKING MADE PERFECT:

AI IS THE KEY TO THE FUTURE FOR URBAN MOBILITY

Smart carparks are increasingly common – from gantry-free systems to app-enabled parking payment – however, the management and maintenance aspects have evolved at a much slower pace. Most car parks in Singapore are still managed by a centralised call centre, and a persistent labour crunch has impeded operators' overall efficiencies. As Singapore accelerates towards a Smart Urban Mobility future, the conventional operation of carparks leaves much to be desired.

AMD partnered with local AI and IoT integrator PlanetSpark, as well as Sun Singapore Systems Pte. Ltd., the largest smart parking solutions provider in Singapore, to develop a parking solution that not only meets the needs of the operator but also empowers them to improve car parking system features and services.

The gaps of legacy infrastructure

Whenever an electronic parking system has a fault, the call centre receives an alert from the system and will dispatch a mobile service technician to fix the problem. However, with the labour shortage, this makes it challenging for operators dispatch resources to the carparks to resolve the issue in a timely fashion.

Another big challenge for car park operators is knowing how long the system will be down, as this impacts revenue and promotes customer dissatisfaction. They also need to be able to track how long a barrier arm is missing, how long a barrier arm stayed up and did not come down, how long drivers had to wait to enter or leave the car park, and how much paper is left on the receipt roll.

All these minute inconveniences are symptoms of a larger systemic issue. The technology inside most electronic parking systems in Singapore is more than two decades old and is no longer equipped to handle the needs of operators today. So even though operators may have access to technologies such as AI, as well as the necessary data on

hand to properly address these challenges, the legacy infrastructure might not be equipped to deliver any new features.

Real-time data, better management

The answer to the predicament came in the form of Sun Singapore's new SunPark system that utilises PlanetSpark's EdgeAI Box X7, powered by AMD Zynq™ UltraScale+™ MPSoCs, to improve vehicle license plate recognition (LPR) accuracy at car park entry and exit lanes.

The EdgeAI Box X7 is designed for video analytics or computer vision for smart cities, smart buildings, and machine vision applications, and among the must-have features, the box needed to be able to handle multiple video streams at the same time, and be power efficient, with very good heat dissipation. With these considerations, PlanetSpark chose AMD Zynq™ UltraScale+™ MPSoCs as the main compute resource because not only did it meet all the above requirements, but AMD's hybrid solutions also combine multiple processing cores on an FPGA-based architecture that can adapt to these changing market needs.

The box is also stackable, meaning that in some use cases such as Sun Singapore's smart parking solution, users could replace several GPUs with the EdgeAI box and perform video analytics with lower latency across more cameras in a smaller, cheaper, and more power-efficient footprint.

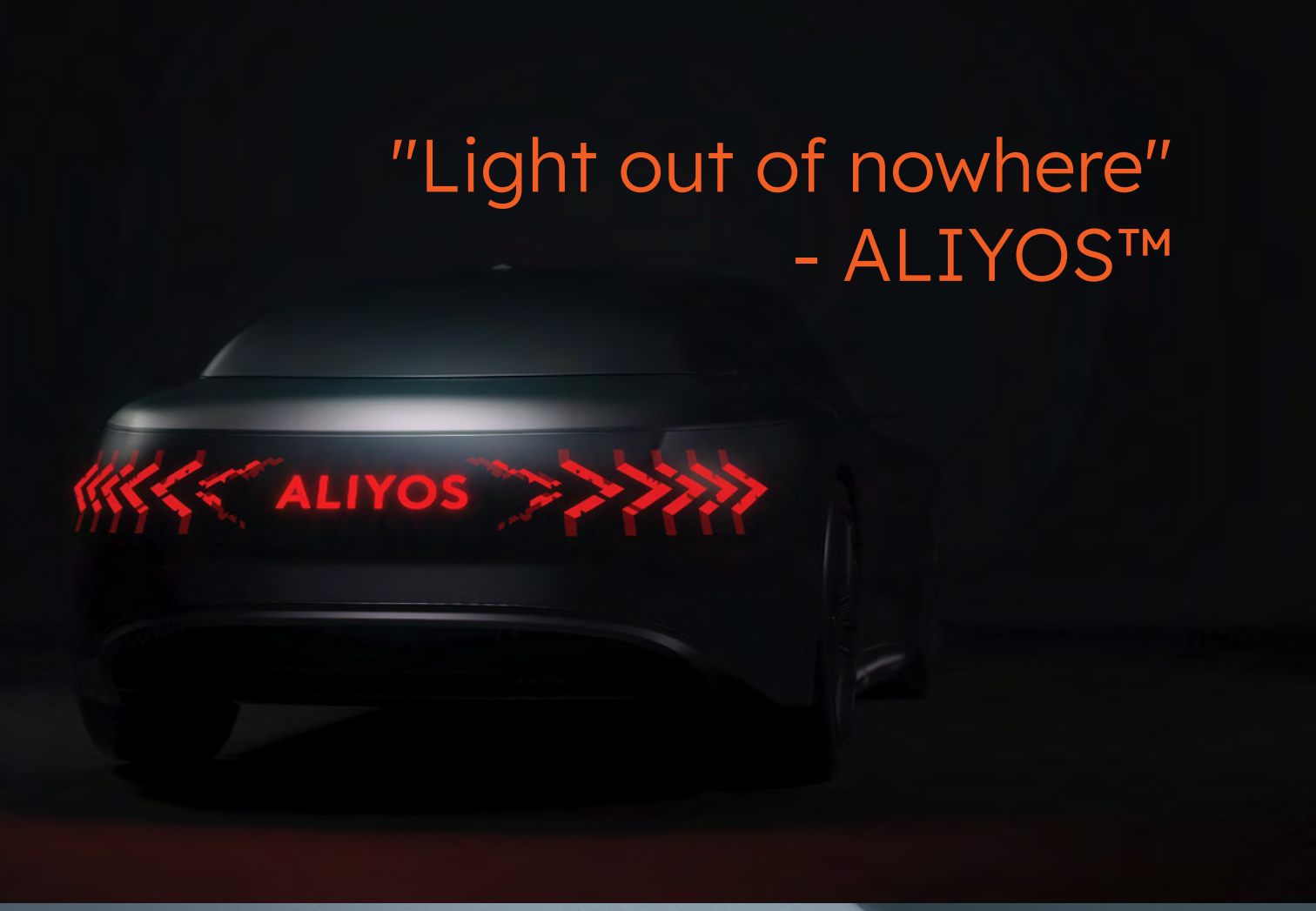
As a result, PlanetSpark's EdgeAI Box enables near-real-time insights to deliver an interactive experience and response, allowing Sun Singapore to introduce cutting-edge features, including lane jam detection, accident spot detection, barrier control, and parking fee assessment. It also provides the car park operator with the flexibility to change and retrain AI models and algorithms to implement other features, including reserved parking lot management and EV charging space monitoring.

With the AMD solution utilising the most up-to-date technology, enabling license plate reading accuracy of 99%, as well as updated parking spot vacancy detection and parking violation enforcement, Sun Singapore is now able to provide a total solution for smart parking.

AMD

Attributed by, **Peter Chambers**
Managing Director, Sales, APAC

"Light out of nowhere" - ALIYOS™



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STEPS TO CIRCULARITY FOR WAFER FABRICATION

As semiconductor demand continues to rise, the industry faces increasing pressure to adopt sustainable practices. Wafer fabrication, a crucial process in semiconductor manufacturing, poses significant environmental challenges, particularly in managing solvents. To address these challenges and reduce environmental impact, a circular approach focused on recycling and recovering solvents is essential for ensuring operational efficiency and compliance with stricter regulations.

Optimizing Water and Solvent Reuse in Wafer Fabrication

Solvents play a pivotal role in wafer fabrication processes, such as coating, cleaning, and printing. However, managing solvent-laden wastewater is challenging, particularly when it comes to efficient recovery. Two primary methods—biological and membrane processes—are commonly employed to address this issue. But each method has its drawbacks. Biological treatments may alter certain solvent components but fail to completely eliminate persistent "forever chemicals." And while membrane processes effectively separate water from solvents, the concentrated solvent streams that result may still contain pollutants, necessitating off-site disposal.

Veolia Water Technologies developed the Macro Porous Polymer Extraction (MPPE) system to address these specific challenges. MPPE efficiently separates solvents from wastewater, allowing for the reuse of both water and solvents. This solution not only reduces wastewater discharge but also enhances resource efficiency. It aligns with the industry's shift toward more circular practices by answering the constant need for ultrapure water while avoiding environmental contamination.

At a semiconductor fabrication plant in Taiwan, Veolia's MPPE system serves as a practical example, recovering over 100 cubic meters of water per hour. This water is redirected for use in cooling towers and eventually into raw water tanks, while the solvents recovered can be repurposed and resold, thereby managing water resources much more efficiently. This allows the fabricator to avoid downtime and focus on its core business.

Environmental and Financial Benefits of Solvent Recovery

Adopting solvent recovery technologies like MPPE provides both environmental and financial advantages. Companies can lower their operational costs by reducing solvent waste and recycling valuable materials to ensure sustainable growth. The MPPE system's minimal operational costs (OPEX) provide a healthy return on investment, making it an attractive solution for wafer fabrication facilities seeking to improve sustainability without compromising on profitability.

From an environmental standpoint, Veolia's solutions enable both water recycling and solvent recovery without generating sludge, which helps fabricators meet their Environmental, Social, and Governance (ESG) targets. For wafer fabrication plants involved in front-end semiconductor manufacturing that utilize over 60,000 cubic meters of water annually, minimizing their impact on the environment is particularly critical. In order to comply with the latest regulations set by Singapore's Public Utilities Board (PUB), these fabricators must recycle at least 50 percent of their annual water consumption. Veolia's expertise with managing the water cycle through reusing and recovering resources helps these businesses save time and generate water savings in their plants, ensuring sustainable growth and reducing environmental impact.

Looking Ahead: Supporting Circularity in Wafer Fabrication

As the semiconductor industry continues its pursuit of sustainability, Veolia remains focused on advancing circular solutions as part of its broader GreenUp strategic plan, which emphasizes three key areas: depollution, decarbonization, and resource regeneration. Readily available

innovations in areas such as zero liquid discharge (ZLD) and heat recovery can assist fabricators in further reducing water consumption and meeting more stringent discharge standards. Additionally, integrating segregated drains for specific solvent streams will facilitate the seamless implementation of recovery technologies like MPPE.

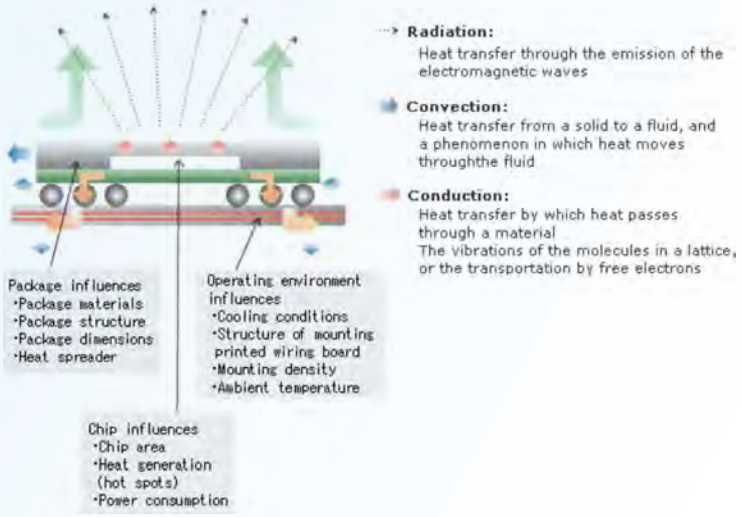
Solvent recovery is a critical step toward achieving circularity in wafer fabrication. By incorporating efficient technologies and sustainable practices, semiconductor manufacturers can optimize operational efficiency while significantly reducing their environmental footprint. The industry's move toward circularity is a shared responsibility, underscoring the need for stakeholders to take action and invest in long-term, sustainable solutions.

Learn more about Veolia's sustainable solutions for the semiconductor industry at *www.asia.veoliawatertechnologies.com/en/expertise/markets/electronics-photovoltaics* or send an email to **mehbub.khan@veolia.com**.

VEOLIA

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

ULTRA- THIN METAL COATING FILM ON INTEGRATED CIRCUITS



Heat impairs safety, reliability, and performance

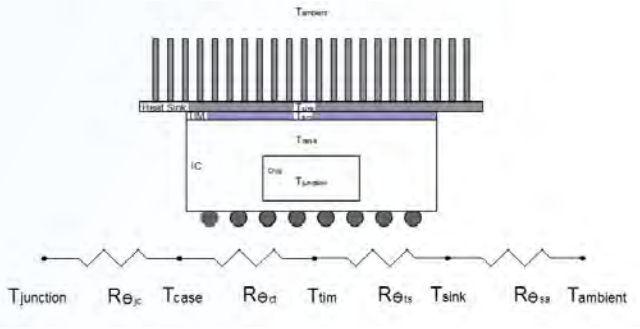
Heat is generated when a current flows through a resistor in an electric circuit. Semiconductor devices may be considered of types of resistors to be generated during ON- state when a current flows through devices when current flows through.

Heat adversely affects all types of devices and seriously threatens safety, performance, and reliability.

In some Chiplets, HPC devices incl. HBM, DDR5, WIFI 6, Cloud Storage of SSD, or commercial application of GaN FETs are all facing stringent challenge of heat dissipation to maintain superior performance and reliability. Some manufacturers have adopted Nickel Film to be attached on top surface of ICs, while still accompanied with furthermore questions of throughput and utility considerations. Nevertheless the thermal conductivity of Nickel is < 90 W/m.K, while with limitation of flexural rigidity, Nickel film can hardly be stamped or forged into thinner than 8 uM that prominently lower down then heat convection ability. Also, the adhesive attachment between the surface and nickel film draw another problems of even higher conductivity, thickness and curing time considerations...

The purpose of heat sinks is to provide a larger surface area on heat-generating electronic components, allowing heat to be conducted more efficiently into the surrounding environment. In the field of electronic engineering design, heat sinks are classified as "passive heat dissipation components", which are made of thermally conductive, lightweight, and easy-to-process metals (mostly aluminum or copper) attached to the heating surface to dissipate heat in a composite heat exchange mode.

The tradition thermal impedance path is as follows:



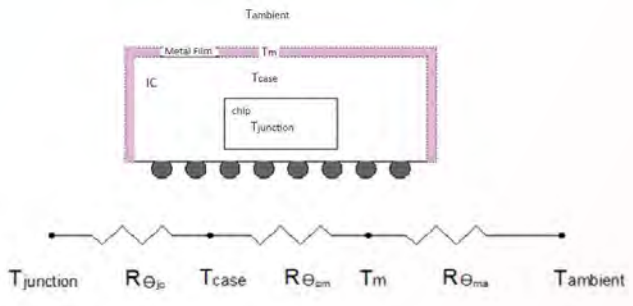
RΘjc: bare die junction to outer shell,
RΘct: shell to thermal interface material,
RΘts: thermal interface material to heat dispersion sheet,
RΘsa: heat dispersion sheet to the surrounding environment.

Basic calculations: When Ta + Pd * (RΘjc+ RΘct+ RΘts+ RΘsa) < TJ, it means that the appropriate heat sink has been selected.

The above is a familiar heat dissipation technology, but with space expansion of and extra costs, traditional ways are not suitable for upcoming application. Therefore, our challenge is to simplify the process and significantly enhance heat dissipation, with untra- low manufacturing costs.

New Invention Technology

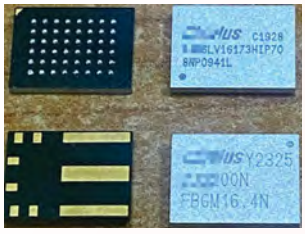
The innovative and improved thermal impedance path is as follows:

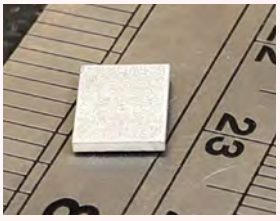


The technology adopts vacuum evaporation coating technology to plate the metal on the IC top surface or even 4 surrounding surfaces adjacent, except for the signal output end face to produce a uniform nano-scale metal film, with thickness of 150~200 nm.

The detailed coating information is as follows:

- $R\Theta cm = \frac{\text{Coating thickness}}{\text{Coating area}} \times \left(\frac{1}{\text{Thermal conductivity of metal}}\ ℃/W\right)$
- $R\Theta ma = \frac{T1-T2}{Pd}$, T1 is the temperature at one end of the coating and T2 is the temperature at the other end of the coating.
- Thermal Conductivity of Metals: Whenever possible, select metals with high thermal conductivity values, Such as silver (420 w/m-) °C, copper (410 w/m-°C), gold (318 w/m-°C), aluminum (237 w/m-°C... and so on.





Comparison Example:

GaN FET with/ without Metal Coating Films in open air without air- flow or other active heat dissipation methods:

without Metal Coating Film, 20V/ 5A (100W)

with Metal Coating Film, 20V/ 5A (100W)

Channel \ Coating Film	NO	YES
CH1	71.7 °C	73.4 °C
CH2	75.1 °C	75.0 °C
CH3	62.6 °C	65.0 °C
CH4	61.3 °C	64.6 °C

MGZ18N65 650V / 130mΩ

From ON- state comparison, we can find it around 3℃ higher on FETs with Metal Coating than normal FETs in open frame with room temp. of 32℃. Which means metal coating prominently conducts and convects heat from junction and chip to the top surfaces on a 100W output GaN adaptor solution.

In some high speed calculation application like NAND Flash Memory and its Controller IC on ME.2 SSD, DDR5/ 6, HBM, FPGA and Chiplets, with active methods of air- or liquid-cooling system will prominently lower down the junction temperature and enhance IC as well as system reliability.

For more information, please send mails to:
till_chang@justlink-advtek.com,
danielyanck@gmail.com

Just- link

ADVANCED TECHNOLOGY

Contributed by, **Mr. Lin Chih Hsiang**,
Vice President of Justlink

Iwatani
Iwatani Corporation

Iwatani Corporation (Singapore) is a premier supplier of *Industrial Gases, Equipment* and *Materials* for the semiconductor industry. Together with our long-term business partners, we offer unrivalled and unique value propositions.

Why safer alternatives to PFAS chemicals are needed?

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) are a large, complex group of synthetic chemicals that have been used in various consumer products since the 1950s. PFAS molecules are made up of a chained link of carbon and fluorine atoms. Because the carbon-fluorine bond is one of the strongest, these chemicals do not degrade easily in the environment.

There is mounting evidence of PFAS environmental persistence and potential health impacts. PFAS have been linked to serious health issues, including cancer, liver damage, and fertility problems. Long-term exposure, even at low levels, is a growing concern due to PFAS's persistence in the body. Certain PFAS chemicals contaminate water sources and soil, persisting for decades. These chemicals bioaccumulate in the food chain, affecting wildlife.

Governments worldwide are implementing stricter PFAS regulations. The United States Environmental Protection Agency (EPA) is considering designating certain PFAS as hazardous substances.

Implications for the semiconductor manufacturers

PFAS-based coolants, cleaners and defluxers are widely used in the frontend wafer fabrication and backend test & packaging processes.

By transitioning to PFAS-free alternatives, semiconductor manufacturers can mitigate liabilities, ensure regulatory compliance, and position themselves as leaders in responsible manufacturing.

PFAS-free Alternatives

In order to meet the needs of the semiconductor industry, our business partner **ITW** has recently rolled out the following PFAS-free alternatives:

- *Techpray Precision-V 3283* is a direct, drop-in replacement for 3M Fluorinert™ FC-3283 coolant
- *Techpray Precision-V 3900* is a non-flammable USA made cleaner with low GWP
- *Techspray Precision-V 3910* is a non-flammable and cost effective USA made defluxer with low GWP

For more information, please get in touch with **Iwatani Corporation (Singapore)**, the *exclusive distributor* of **ITW**'s PFAS-free products.

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65-6220-8347 **sales.semicon@iwatani.com.sg**

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ACCELERATING INNOVATION THROUGH COLLABORATION

Singapore's thriving semiconductor ecosystem is dominated by multinational corporations (MNCs). For it to continue to thrive, the ecosystem needs a more balanced foundation, and this means more startups to continue disrupting, and more small and medium-sized enterprises (SMEs) to continue innovating. But sometimes, they encounter barriers such as high capital requirements, and lack of skilled talents. One of the ways to overcome these challenges is through collaboration.

Innovation through collaboration is essential for staying relevant in this rapidly evolving industry. Collaboration can open doors for partners allowing them to tap into expertise and gain know-how in systems and technologies in a shorter time. The key is finding a match for a win-win partnership. For synergy to catalyse, it is better for all parties to focus on what they lack most, rather than what they would gain most out of the partnership. When these shortcomings are adequately addressed, the parties would have reached a shared goal and focus to co-innovate. As we have

learned through our Co-Innovation Program for startups, Design House Partnership and other collaborations, not all partnerships will achieve the desired synergies.

One successful example was with Sysmac, a local SME, on the Digital Packing Line+ (DPL+) project. Infineon and Sysmac worked together to pioneer a new approach to automate the packing process, resulting in improved productivity, reduced costs, and a lower carbon footprint.

We brought technical experts with their own fields of expertise together, relied on one another's strengths, to achieve the improvements in the metrics we agreed upon, and ultimately gained new domain knowledge and experience.

Setting clear expectations and defined goals is crucial during collaboration. Both companies may have gaps in their knowledge, and it is essential to acknowledge and address these gaps early on. A collaborative mindset is also crucial. By embracing flexibility and openness to innovation, both parties can achieve more together, and do so more effectively.

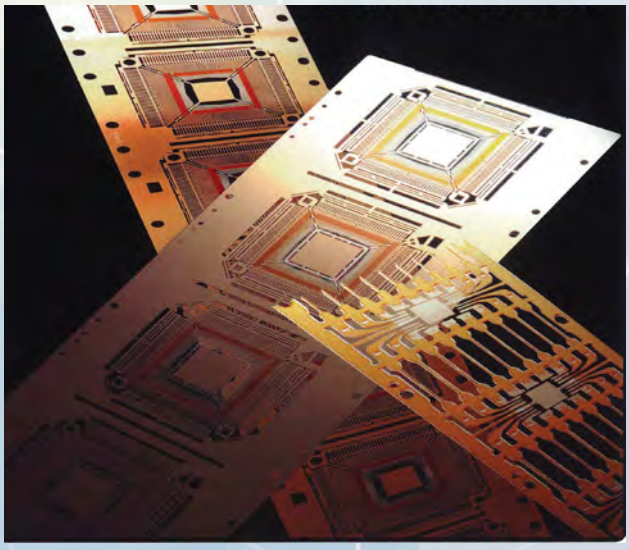
Infineon is driving digitalization and decarbonization through innovation and collaboration, leveraging expertise and resources in the most effective way to develop sustainable solutions for a more sustainable future.

FORGING NEW FRONTIERS:

COLLABORATIVE EXCELLENCE IN ADVANCING SEMICONDUCTOR INNOVATION

Since its establishment in 1992, ROKKO Singapore has been at the forefront of innovation, forging new frontiers and building a legacy of collaboration that drives mutual growth. ROKKO's journey began with a commitment to precision engineering and trim and form dieset solutions, effectively supporting the semiconductor back-end sector with a comprehensive range of materials and spare parts. From the very beginning, ROKKO recognized the transformative power of partnership, joining forces with industry players to develop tailored solutions that challenge the limits of potential.

As the company expanded into the design, development, and manufacturing of advanced semiconductor equipment, it forged robust alliances. Based on the understanding that meaningful progress in the semiconductor industry hinges on shared expertise and resources. These strategic partnerships have included supplying semiconductor leadframe materials for critical applications in the automotive and medical sectors. By collaborating intimately with customers and industry leaders, ROKKO ensures that its innovations are not only cutting-edge but also aligned with the specific needs of each partner, fostering a spirit of unity that is essential for mutual success.



leadframes

ROKKO's dedicated team of over 250 employees embodies this collaborative ethos, working alongside partners to solve challenges and seize opportunities. Over the years, ROKKO has cultivated a reputation for reliability and responsiveness, strengthened by the trust of a loyal customer base. This network of enduring relationships has become a cornerstone of resilience and sustained growth in an ever-evolving industry.

In today's rapidly changing semiconductor landscape, unity is more crucial than ever. The global shortage of skilled labour, rising costs, and pandemic disruptions have underscored the necessity for collaboration. ROKKO has adeptly navigated these challenges by leveraging partnerships to co-create innovative solutions and achieve shared goals.

Ultimately, ROKKO's unwavering support empowers companies to excel in their core activities, secure in the knowledge that they have a partner committed to their success. Through unity in partnerships, ROKKO transcends the role of a mere supplier; it stands as a collaborator, ensuring that together we continue to forge new frontiers and shape the future of the semiconductor industry.

Auto Sawing & Sorting RS-8000V

THE TRANSFORMATIVE IMPACT OF AI ON TEST AND MEASUREMENT

Artificial intelligence (AI) is rapidly emerging as the defining technology of our era, fundamentally transforming various sectors, including test and measurement (T&M). This shift is not just a technological upgrade; it's a complete reimagining of how products and systems are tested and validated. AI is revolutionizing T&M by embedding machine learning capabilities into every layer of product and system architecture, enabling unprecedented levels of insight and efficiency.

NI's role in Enhancing Engineering Workflow

As a leader and expert in the T&M industry, Emerson's Test and Measurement business – NI, is at the forefront of this AI-driven evolution. NI's solutions are not just about automating tasks but also about fundamentally improving engineering workflows and product lifecycle management.

One of the most critical objectives in this AI-driven transformation is empowering T&M engineers with the tools and capabilities to fully exploit AI's potential. AI is not merely about automating tasks—it's about enhancing human capabilities by providing deep, reliable data insights, streamlining repetitive engineering tasks and allowing engineers and scientists to focus on driving value and creating intellectual property (IP). This is especially crucial as systems become increasingly software-defined, where traditional testing methods may fall short. This approach is aligned with NI's commitment to empowering engineers with the best tools to drive innovation and efficiency.

Principles of AI Integration in T&M

To ensure that AI is effectively integrated into T&M processes, three guiding principles have been established:

1. **Engineer-Led**: AI in T&M should be a tool that enhances, rather than replaces, human decision-making. By equipping engineers with AI-powered tools, they can make more informed, transparent, and auditable decisions, unlocking the true potential of intelligent testing.

2. **AI-Enhanced**: AI should improve operational efficiency and provide deeper insights. Demonstrations at industry events have shown that AI can significantly accelerate testing processes, enhance data analysis, and streamline workflows. For example, AI can simplify signal processing, detect defects early, and offer actionable recommendations, thereby reducing the time and effort required for testing.

3. **Industry-Ready**: AI solutions must comply with industry standards, especially regarding data security and privacy. Engineers should be able to use local language models within their labs to maintain data integrity and protect proprietary information.

Driving Intelligent Test Forward

The concept of **Intelligent Test** is central to this transformation. Intelligent Test systems automate measurements, deploy advanced analytics, and recommend actions to improve outcomes. These systems leverage data, algorithms, and domain-specific knowledge to become increasingly automated, predictive, and adaptive. While AI is a significant part of this workflow, other cutting-edge technologies also contribute to optimizing testing processes.

The Role of Digital Twins

A significant innovation in this space is the use of digital twins—virtual replicas of physical systems that allow for simulation and optimization. For digital twins to be effective, they require high-quality data, which Intelligent Test systems can provide. By ensuring the availability of accurate data, these systems enable organizations to push the boundaries of their capabilities, optimizing complex systems in ways that were previously unimaginable.

Addressing Challenges

One of the key challenges in T&M is the disjointed nature of product stages, which can create bottlenecks and extend validation cycle times. Intelligent Test systems address these issues by automating workflows, improving data quality, and optimizing test plans. This not only reduces the time required for testing but also enhances the overall quality of the process.

The Future of Intelligent Test

Looking forward, Intelligent Test systems are set to enhance productivity, operational efficiency, data insights, and system performance. They will evolve from task-centric to device-centric workflows, automating low-value tasks, and enabling advanced features like semantic search for intellectual property (IP) reuse. While AI will be a crucial component of this evolution, the overarching goal is to use the best technologies available to achieve optimal outcomes.

The impact of AI on T&M is poised to surpass even the most significant technological shifts of the past, such as the advent of the cellphone, PC, and internet. As the first human-invented tool capable of using other tools on our behalf, AI's integration into test systems will drive significant advancements. By embracing Intelligent Test systems today, the industry will be better prepared to tackle the complexities of tomorrow's products, ensuring better quality, faster time-to-market, and reduced costs.

In Singapore, the focus is on driving a value-added economy, and AI plays a crucial role in this vision. The integration of AI into T&M is not about replacing jobs but about augmenting human capabilities. By streamlining repetitive engineering tasks, AI allows engineers and scientists to concentrate on creating value and developing IP. This aligns with Singapore's broader goal of fostering innovation and enhancing economic value.

In summary, Intelligent Test represents a significant evolution in T&M, driven by AI, to meet the growing complexity and demands of modern technology development.

With NI leading the change, the industry is poised to achieve unprecedented advancements in quality, efficiency, and innovation.

EMERSON | NI

NAVIGATING DIGITAL TRANSFORMATION IN THE SEMICONDUCTOR INDUSTRY:

A DATA- AND AI-DRIVEN APPROACH

The semiconductor industry is embracing digital transformation to optimize processes, enhance efficiency, and drive innovation. This shift necessitates a comprehensive approach that leverages data and AI effectively. Just as raw materials are essential for manufacturing, data is the foundation for digital transformation. AI serves as the tool to process and extract insights from this data, while analytics provides the blueprint for its strategic utilization.

The Acatech Industrie 4.0 Maturity Model[1], a framework for assessing Industry 4.0 maturity, offers a valuable roadmap for semiconductor companies embarking on their digital transformation journey. This index highlights six stages of maturity, from computerized data collection to self-optimizing production. By understanding their current position on this index, companies can identify opportunities to harness data and AI for maximum impact.

[1]Refer to https://en.acatech.de/publication/industrie-4-0-maturity-index-update-2020/

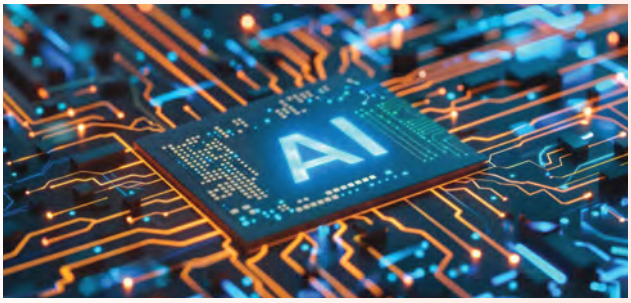
Semiconductor companies can begin their digital transformation journey by utilizing no-code/low-code platforms to digitize processes and build databases for efficient data collection. As they advance, they can create dashboards for data visualization and decision-making support, eventually adopting advanced analytics and optimization techniques for prescriptive insights and automated actions.

In the highly competitive semiconductor industry, reaching the highest stage of digital transformation — such as Level 6 — offers significant advantages. At this stage, AI and advanced analytics, including mathematical optimization, can autonomously enhance production efficiency, improve yields, reduce waste, and minimize downtime. This also enables agile responses to market changes and production challenges, leading to faster time-to-market, increased operational efficiency, and greater capacity for innovation.

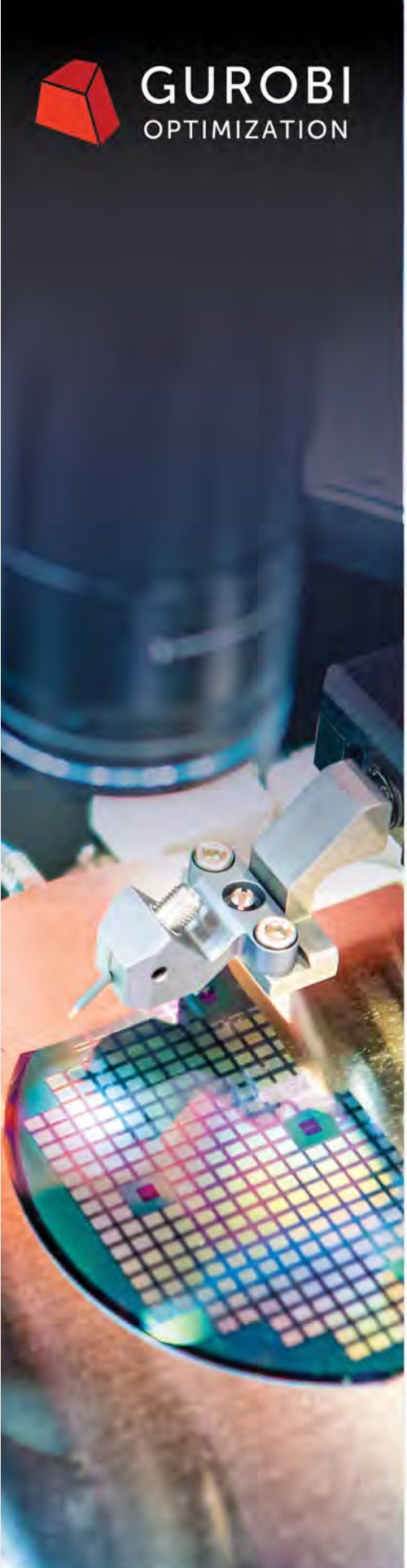
Singapore Polytechnic's Data Science and Analytics Centre (DSAC) is committed to partnering with semiconductor companies throughout this journey. DSAC aims to provide one-stop support to enterprises in AI and Analytics through Innovation, Solutioning, and Training. The centre provides comprehensive support, including:

- **Applied AI solutions:** Developing and implementing tailored AI solutions to address specific business challenges.
- **Customized training programs:** Equipping workforces with essential data science and AI skills.
- **Data-Driven Digital Transformation Program:** Working with companies to identify implementable projects to support their digital transformation strategies.
- **Overseas Immersion Program in AI:** Equipping leaders with the knowledge and insights to drive AI adoption in their organizations.

To explore collaboration opportunities, contact SP DSAC at **SPAN@sp.edu.sg**. Please include 'DSAC' in the subject line.



Contributed by, **Dr Edna Chan**
Centre Director of the Data Science and Analytics Centre, Singapore Polytechnic



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With Gurobi technology and services from Optimization Analytics Technology, you can transform the way you do business—streamlining operations, improving yield rates, and optimizing resource allocation.

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KITAKYUSHU:

JAPAN'S PIONEER OF CIRCULAR ECONOMY AND THE ECO TOWN PROJECT

Case Study: Amita Holdings' Circular Economy Solutions for the Semiconductor Industry

Kitakyushu, a vibrant city located in Japan's Fukuoka Prefecture, has emerged as a global leader in circular economy initiatives and environmental innovation. Once facing severe pollution from rapid industrialization, the city has transformed itself into a beacon of sustainability. Today, Kitakyushu's commitment to ecological preservation is embodied in its flagship initiative—the Kitakyushu Eco-Town Project, which stands as a testament to how industrial cities can reinvent themselves to thrive in harmony with the environment.

The Kitakyushu Eco-Town:
A Model for Sustainable Innovation

Launched in the 1990s, the **Kitakyushu Eco-Town Project** was created to address the city's pressing environmental challenges while driving economic rejuvenation. By focusing on waste management, recycling, and the promotion of green technologies, the Eco-Town has become a critical player in Japan's circular economy efforts.

Kitakyushu has implemented cutting-edge waste recycling systems that target everything from plastics to metals and organic waste. By minimizing landfill use and recovering valuable materials for manufacturing, the city has made significant strides in resource efficiency. This integrated approach fosters innovation in renewable energy, eco-friendly construction, and sustainable transportation, positioning Kitakyushu as a hub for environmental research and development.

The Eco-Town is not just about business and technology. Community involvement plays a key role, with initiatives such as eco-museums and educational workshops helping to spread environmental awareness. Through these activities, Kitakyushu's residents are encouraged to adopt sustainable practices in their daily lives, further contributing to the city's ecological transformation.

Central to the success of the Eco-Town initiative is the **Kitakyushu Interdependent Business Consortium for Sustainable Development (KICS)**, a collaborative effort that unites local businesses, government bodies, and academic institutions. KICS focuses on promoting sustainable business practices, fostering community engagement, and advancing innovations in environmental technology. This network encourages companies to adopt green practices, share best strategies, and collaborate on projects that reduce their environmental impact while enhancing resource efficiency.

Amita Holdings:
Driving Sustainability in the Semiconductor Industry

One of the standout companies within the Kitakyushu Eco-Town is **Amita Holdings**, a leader in environmental services for the semiconductor industry. Established in

1977 and listed on the Tokyo Stock Exchange in 2006, Amita Holdings has been at the forefront of circular economy solutions for decades, with a presence across Japan and internationally.

At its **Kitakyushu Recycle & Resources Center**, Amita recycles liquid waste generated from the cutting of silicon wafers used in semiconductor manufacturing—a notoriously difficult process. Utilizing proprietary technology, Amita successfully separates the waste into solid and liquid components, with the solids being repurposed for other industries and the liquids re-entering the silicon manufacturing process. This breakthrough not only reduces the environmental footprint of semiconductor production but also exemplifies the kind of high-tech recycling innovations that are essential for the circular economy.

In July 2024, Amita further automated its operations at the Kitakyushu facility, in anticipation of increased demand driven by Japan's burgeoning semiconductor sector. The company's ongoing work with semiconductor manufacturers aims to refine and develop even more advanced recycling processes, positioning Amita as a pivotal player in creating a more sustainable semiconductor industry.

Expanding Amita's Impact in Asia and Beyond

Amita Holdings is not content to limit its innovations to Japan. The company is exploring opportunities to expand its silicon wafer recycling technology to **Singapore**, a nation grappling with landfill limitations as it strives to become a low-carbon society. Amita is conducting a feasibility study in partnership with **Re Sustainability Limited**, one of Asia's largest waste management companies. The aim is to commercialize this technology within a few years, providing a sustainable solution to Singapore's semiconductor waste challenges.

In addition to Singapore, Amita is eyeing expansion throughout Asia. The company already operates in South Korea, Taiwan, Malaysia, and Indonesia, where it continues to pioneer circular economy practices in waste management and by-product utilization for various industries.

Kitakyushu and Amita Holdings:
Paving the Way for Global Sustainability

Kitakyushu's transformation from a polluted industrial city into a global leader in sustainability is a powerful example of what can be achieved when cities embrace the circular economy. The **Kitakyushu Eco-Town Projec**t and companies like **Amita Holdings** exemplify how forward-thinking environmental initiatives can drive economic growth while protecting the planet.

As the world faces mounting environmental challenges, Kitakyushu's model offers invaluable lessons for other cities and industries. By combining advanced waste recycling, community involvement, and strong business collaboration, Kitakyushu is setting a new standard for urban sustainability, with Amita Holdings leading the way in creating circular solutions for one of the world's most resource-intensive industries.

For more information on the Kitakyushu Eco-Town Project and Amita Holdings' circular economy initiatives, visit **Amita Holdings**.

AMITA アミタホールディングス

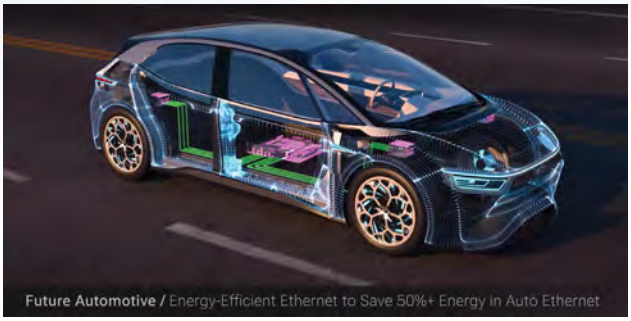
DRIVING THE SEMICONDUCTOR INDUSTRY FORWARD:

REALTEK'S KEY INITIATIVES AND THEIR IMPACT

The semiconductor industry stands at the crossroads of technological advancement and economic growth, playing a critical role in powering everything from consumer electronics to cutting-edge automotive technology. As demand for semiconductors continues to surge, innovative initiatives are being implemented to drive the industry forward. In Singapore, a vibrant ecosystem is emerging – and Realtek Singapore is actively contributing to this important endeavor. The following article explores some of the key initiatives that Realtek is shaping the semiconductor landscape in Singapore and Southeast Asia – including, but not limited to upcoming internship programs, participation in industry associations like the SSIA, as well as contributing to the technical discussions on automotive ethernet as an active Board member in the OPEN Alliance.

Internship Program 2.0: Nurturing Future Talent

One of the most promising initiatives that Realtek Singapore is reaffirming is the launch of internship programs in collaboration with renowned institutions such as NUS, NTU and many others. These programs are designed to bridge



the gap between academic learning and practical experience, equipping students with the skills and knowledge needed to thrive in the semiconductor sector. We are set to re-launch a brand new curriculum in 2025 that better prepare the students for a career in this increasingly important, and highly relevant area.

As the semiconductor industry grows, so does the need for skilled professionals. The internship programs aim to attract a diverse pool of talent, enabling students to gain hands-on experience in semiconductor design. By partnering with top universities, the industry taps into a wealth of fresh ideas and perspectives, fostering innovation and creativity.

Students participating in these internships will have the opportunity to work alongside experienced engineers and industry leaders, gaining insights into real-world challenges and cutting-edge technologies. This exposure not only enhances their technical skills but also helps them build valuable professional networks, paving the way for future employment opportunities.

Strengthening the Semiconductor Ecosystem

The semiconductor ecosystem is multifaceted, involving various stakeholders, including manufacturers, suppliers, research institutions, government agencies, and industry associations. To strengthen this ecosystem, active engagement with these partners is essential. In addition to industry associations that Realtek has been part of for many years – one significant initiative in this regard is our company's role as an active Board Member of the OPEN Alliance, an automotive Ethernet technical body. As automotive becomes one of the main pillars for Realtek Singapore, our role is not just participation, but active contribution to the latest ethernet technical discussion.

Setting the Direction for Automotive Ethernet Innovation

The OPEN Alliance is dedicated to setting innovative technical discussions for automotive ethernet, which is

crucial for the development of advanced automotive technologies, including autonomous driving and connected vehicles. By being actively involved in shaping these standards, our company is influencing the future of automotive technology and ensuring that Singapore remains at the forefront of the automotive IC design.

This involvement provides several tangible business outcomes. First, it positions our company as a thought leader in the automotive semiconductor sector, enhancing our reputation and attracting potential partners and clients. Second, it facilitates collaboration with other industry leaders, fostering an environment of shared knowledge and resources that can drive innovation.

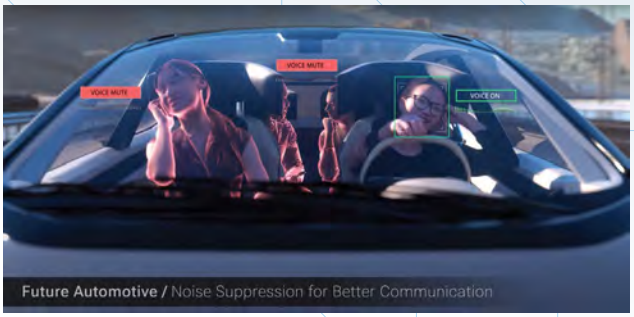
Impact on OEMs, Tier-1s, and Tier-2s

The standards developed through the OPEN Alliance have significant implications for Original Equipment Manufacturers (OEMs) and their suppliers, including Tier-1 and Tier-2 companies. By establishing clear guidelines and specifications, the alliance helps streamline the development process, reducing time-to-market for new technologies.

This collaborative approach benefits individual companies and strengthens the overall semiconductor ecosystem in Singapore. As OEMs and their suppliers adopt these innovative standards, they contribute to a more efficient and interconnected supply chain, enhancing competitiveness and driving growth in the region.

Singapore as a Hub for Southeast Asia's Semiconductor Ecosystem

Singapore is a central hub for the semiconductor ecosystem in Southeast Asia, leveraging its strategic location and strong infrastructure to attract industry players. With a growing footprint in the region, having offices in both Vietnam and Malaysia, our company is well-positioned to tap into the region's talent and technical capabilities. Furthermore, we are expanding our operations in India and Germany from Singapore, which enhances our global reach and collaboration opportunities.



This expansion not only strengthens our supply chain but also fosters knowledge sharing and innovation across borders. As Singapore continues to lead in semiconductor development, it serves as a critical nexus for fostering partnerships and driving growth in the Southeast Asian market.

Conclusion

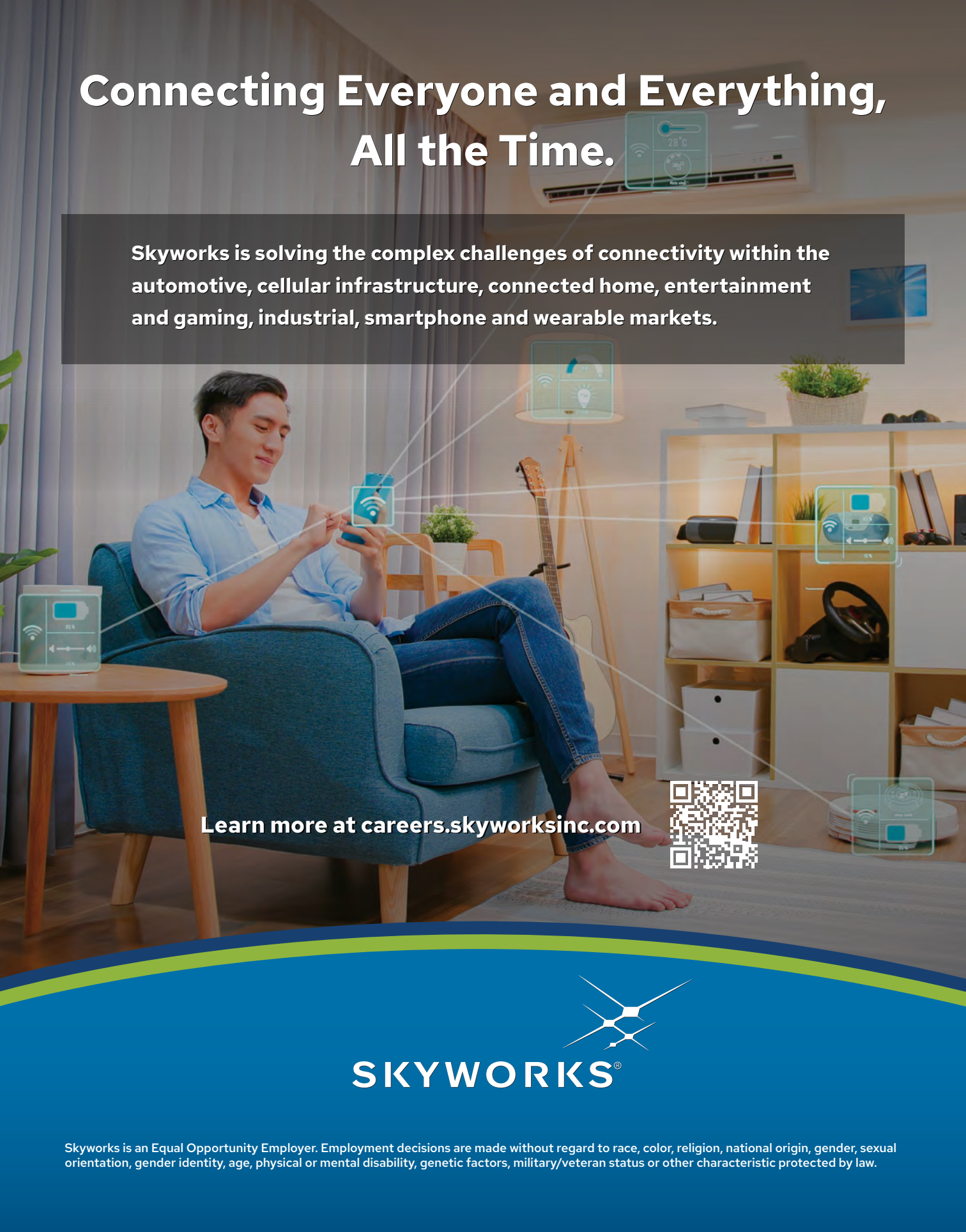
The semiconductor industry is undergoing a transformative period, driven by initiatives that prioritize talent development and collaborative innovation. Through internship programs in partnership with NUS and NTU, along with local collaborations with the EDB and research institutions, Realtek Singapore is actively attracting and cultivating the next generation of semiconductor professionals, ensuring a robust talent pipeline for years to come.

Moreover, our active participation in the OPEN Alliance exemplifies a commitment to setting innovative standards that will shape the future of automotive technology and strengthen the semiconductor ecosystem in Singapore. By fostering collaboration among industry stakeholders, these initiatives drive business outcomes and position Singapore as a global leader in the semiconductor sector.

As we continue to invest in talent and innovation, the future of the semiconductor industry looks promising, with endless possibilities for growth and advancement. Together, we are not just meeting the demands of today's market but also laying the groundwork for a more innovative and sustainable future in technology.

REALTEK SINGAPORE

Written by, **Angela Yeh**
Senior Director, Realtek Semiconductor Corp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CASE STUDY:

INNOVATING SEMICONDUCTOR MANUFACTURING WITH 3D PRINTING

The Challenge

In the dynamic and highly competitive semiconductor industry, staying ahead through innovation and ensuring supply chain resilience are vital for continued success. Creatz3D Pte Ltd, a leading Singapore-based SME, identified an opportunity to advance these goals by leveraging cutting-edge 3D printing technology to produce high-performance technical ceramic and polymer parts tailored specifically for semiconductor applications.

About Creatz3D

Creatz3D stands at the forefront of advanced 3D printing solutions, specializing in the creation of customized, high-quality components across various industries, with a strong focus on the semiconductor sector. Their deep expertise in materials like ceramics and polymers allows them to meet the stringent demands of semiconductor manufacturing, driving innovation and operational efficiency.

SSIA's Role

Recognizing Creatz3D's potential to transform semiconductor manufacturing, the Singapore Semiconductor Industry Association (SSIA) played a crucial role in connecting them with key industry players. SSIA facilitated strategic introductions and provided platforms for showcasing their technology, leading to significant collaborative projects.

One notable collaboration supported by SSIA involved partnering with a major semiconductor company to design and produce critical lifting pins for the Chemical Vapor Deposition (CVD) Chamber. This partnership culminated in the full production qualification of the 3D printed parts, showcasing the capabilities of Creatz3D's technology.

Another successful project facilitated by SSIA involved the development of a 3D printed Polycarbonate Robot Teaching Jig, which replaced a traditional quartz component used in training. This innovative solution led to several impactful outcomes:

New Design: Eliminated the risk of production quartz boat breakage during transferring and teaching.

Reduced Maintenance Time: Achieved a 50% reduction in preventive maintenance time, cutting it from the usual 4-5 hours.

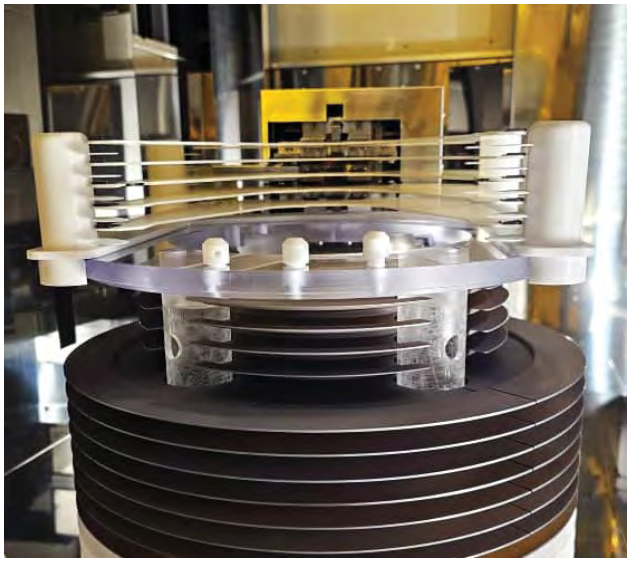
Improved Precision: Enhanced the quartz boat position centering, leading to improved process thickness sigma performance.

These innovations not only improved training effectiveness but also increased operational efficiency for Creatz3D's clients.

The Impact

With SSIA's support, Creatz3D has successfully demonstrated the transformative impact of 3D printing in semiconductor manufacturing. Their innovations have not only met the industry's high standards but have also significantly improved precision, performance, and efficiency for their clients.

Creatz3D continues to lead in semiconductor manufacturing innovation, with ongoing projects aimed at leveraging ceramics 3D printing for various products. Their future plans also include internationalization efforts, further solidifying their position at the cutting edge of industry advancements.



CREATZ3D

THE SEMICONDUCTOR ECOSYSTEM

The semiconductor industry is often portrayed as a technological marvel driven by cutting-edge research, advanced manufacturing processes, and large-scale production. However, beneath this surface lies a vast network of supporting units that enable its success. This ecosystem goes far beyond just the companies making the chips. It includes logistics, infrastructure, cleanroom facilities, testing, research partnerships, and government support—all working in harmony to fuel the growth and competitiveness of the industry.

Logistics and Supply Chain: Chasen Logistics Playbook

While chip manufacturers may take center stage, the logistical operations that move raw materials, components, and finished products are the unsung heroes. The semiconductor industry relies on precision, and the same holds true for the transportation and handling of delicate components.

Specialized logistics providers like Chasen Logistics Services Ltd. (CHASEN) are pivotal. With our focus on the semiconductor industry, we offer tailored services such as:

Relocation - We provide expert handling and relocation services for high-value semiconductor equipment, including full turnkey solutions for moving entire facilities, ensuring minimal disruption to operations and careful handling of sensitive machinery.

3PL Transportation - We provide customized land transport inclusive of temperature controlled air-ride trailers, low-bed trailers, and conveyance transfer of cargo from aircraft to trailer solution as semiconductor machinery and equipment are highly sensitive to impact and vibration. Our proprietary Transport Management System (TMS) allows EDI integration and provides real-time tracking and management of movement from drop order, e-POD, to invoicing, ensuring seamless and efficient delivery of goods.

Warehouse - Comprehensive warehousing services offering ambient, temperature and humidity control, security, racking, high ground to ceiling height catering for all different types of cargo. Our proprietary Warehouse Management System (WMS), is equipped with EDI transfer to customer's SAP system and provides systematic and accurate inventory management control.

Value Added Service

Packing/Crating - Our professional crating team specializes in designing and constructing custom wooden crates to safeguard your machinery and equipment. We also provide a variety of packaging solutions tailored to diverse logistical requirements, including cargo protection and compliance with insurance standards. Additionally, we offer ISPM15 fumigation or heat treatment for export purpose.

Tier 0 Installation – We provide assistance with installation services after the machine has been placed at the designated location. We have in-house capability for the installation of AMAT and Axcelis Implanter series.

Cleanroom for machine Buy-off/ refurbishment/ retrofitting - While manufacturers often maintain their own cleanrooms, many smaller outfits within the ecosystem do not have such facility locally. CHASEN is uniquely positioned with their bespoke cleanroom to rent or lease these facilities. These spaces offer clients the flexibility to test and certify equipment, repair sensitive machinery; inspection for machine buy; perform R&D work without needing to build their own cleanrooms from scratch. The leased cleanroom infrastructure facilitates end user to run operations locally in Singapore which is a major hub for Asia Pacific and enjoy savings for both time and high logistical freight forwarding cost.

Interdependence

The semiconductor ecosystem thrives on the interdependence of manufacturers, service providers, logistics experts, cleanroom facilities, and testing labs. Beyond the end products, it's the collaboration of these key players that drives efficiency and innovation. CHASEN plays a critical role within this ecosystem with bespoke one-stop integrated logistics solutions to support the industry's success.

CHASEN™

5 THINGS YOU SHOULD KNOW ABOUT HIGH NA EUV LITHOGRAPHY

Bringing you the what, why and how behind the latest extreme ultraviolet (EUV) lithography systems

After a decade of R&D, ASML shipped the first modules of the first High NA EUV lithography system to Intel in December 2023. The TWINSCAN EXE:5000 represents a significant step forward for cutting-edge chip manufacturing.

The latest extreme ultraviolet (EUV) lithography systems: ASML High NA EUV

Chipmakers rely on shrink – making transistors smaller and packing more of them onto silicon wafers – to drive advances in microchip technology. It's not the only way to improve chips; novel architectures, for example, can also enhance performance. But there's a reason why Moore's Law is essentially the law of the land: Shrink has been behind an exponential growth in computing power for more than 50 years.

For years we've been pushing deep ultraviolet (DUV) lithography to its limits. To reduce the size of the smallest feature that can be printed, known as the critical dimension (CD), there are two main knobs we can turn: the wavelength of light, λ, and the numerical aperture, NA. Now, however, there's little room left to adjust those knobs in our DUV systems.

EUV lithography allowed us to make a big turn of the wavelength knob: It uses 13.5 nm light, compared to 193 nm for the highest-resolution DUV systems. When our first pre-production EUV lithography platform, the NXE, first shipped in 2010, it delivered a drop in CD from more than 30 nm in DUV down to 13 nm with EUV.

An open, fully assembled TWINSCAN EXE:5000

What is High NA EUV lithography?

High NA EUV is the next step in our constant pursuit of shrink. Like NXE systems, it uses EUV light to print tiny features on silicon wafers. And by turning the NA knob, we deliver even better resolution: The new platform, known as EXE, offers chipmakers a CD of 8 nm. That means they can print transistors 1.7 times smaller – and therefore achieve transistor densities 2.9 times higher – than they can with NXE systems.

Working in the High NA cleanroom

How did we get a higher resolution in our High NA EUV systems? Why are chipmakers investing in the new technology? And what does this mean for you? Scan the QR code to learn more.

ASML

SSMC'S COMMITMENT TO QUALITY, INNOVATION & A GREEN SUPPLY CHAIN

Suppliers have been integral to SSMC's 25-year journey of excellence. Each year, we organize Supplier Day to foster collaboration and celebrate mutual growth. Recently, we have accelerated efforts to support our Environmental, Social and Governance (ESG) strategy, working closely with supply-chain partners to reduce their environmental footprint. This aligns with SSMC's vision of enriching lives for a better future. At Supplier Day 2024, alongside our focus on Quality and Innovation, we introduced topics related to ESG to align our long-term sustainability goals and encourage all suppliers to adopt green supply chain management practices and actively collaborate to address climate-related challenges.

TRANFORMING FOR A GREENER AND BETTER FUTURE

At the Supplier Transform Convention (a platform aimed at fostering collaborative problem-solving and continuous improvements), suppliers showcased their innovative projects. These projects highlighted new value creation as well as technologies and capabilities that accelerate sustainable transformation towards climate and environmental goals.

A COLLABORATIVE APPROACH TOWARDS CARBON NEUTRAL

During the Supplier Appreciation Dinner, we celebrated collaborative achievements and mutual successes. In his welcome address, Mr. Ivan Hee, VP of Supply Chain & Business Operations, underscored the vital role of partnerships and our shared commitment to a greener future. He thanked our suppliers for their strong support, which has enabled SSMC to make substantial progress in reducing our carbon footprint within the semiconductor industry.

BUILDING A RESILENT SUPPLY CHAIN & GREEN FUTURE TOGETHER

In his keynote address, Mr. Lim Soon, CEO of SSMC, outlined our vision of becoming the world's leading supplier of quality semiconductor wafers. To achieve this, we must continue to foster strong supplier partnerships, drive continuous quality improvement, enhance supply chain resilience, and maintain cost competitiveness, all while delivering excellent services with a carbon-free supply and sustainable environmental practices. To express our sincere appreciation and recognize our top suppliers for their outstanding contributions to safety, quality, productivity, cost efficiency and ESG excellence, the 2024 awards were presented in three categories: Best Supplier Awards, Partnership Awards, Supplier Transform Awards for Quality & ESG and a Special Recognition Award for Safety.

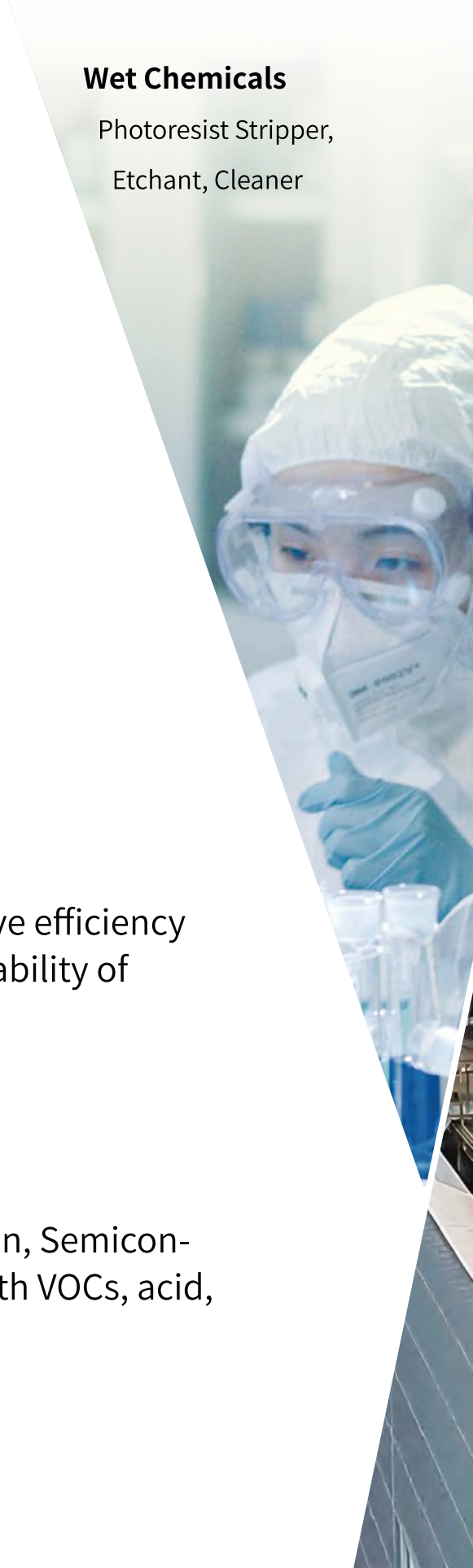
Looking ahead, growing demand for semiconductors from the impact of digitalisation on lives and businesses will likely accelerate the increase in industry emissions as production grows. To address climate risks, SSMC is stepping up sustainability commitments by collaborating with suppliers to address scope 3 emissions and achieve the goal of carbon neutral along the semiconductor supply chain.

ssmc
(A Joint Venture of NXP and TSMC)

Wet Chemicals

Photoresist Stripper,

Etchant, Cleaner



GREEN HIGH-TECH SERVICE PROVIDER

AIM FOR *Net Zero*

Embrace innovative cooperation to improve efficiency
Green the manufacturing to foster sustainability of semiconductor industry

PROJECT

Apply exhaust process solutions in Semicon, Semiconductor Display, and New Energy to deal with VOCs, acid, alkaline and special exhaust gases

Green High-Tech Facility System Solutions

General Exhaust System
Acid and Alkali Exhaust System
Toxic Exhaust System
VOCs Exhuast System
Process Exhaust Coated Duct
Chemical/Slurry Dispenseing System (CDS)
Solvent Recovery System (SRS)

Semiconductor Supporting Equipment and Core Components

Vacuum Pump, Chiller, Local Scrubber, Local VOC

CELEBRATING
MENTAL HEALTH DAY:

ams OSRAM's COMMITMENT TO WELL-BEING

In October 2024, ams OSRAM Singapore took a significant step in prioritizing employee well-being by introducing a dedicated Mental Health Day as part of Global Health Month. This initiative provides team members with an essential opportunity to recharge, reduce stress, and combat burnout, particularly benefiting high performers who return refreshed and ready to contribute to a positive workplace environment.

Beyond Mental Health Day, ams OSRAM has been proactive in promoting mental wellness through bi-monthly talks centered on mental well-being. This October, a special session titled "Self-Care is Not Selfish" encouraged employees to prioritize their mental health and self-care.

To further enhance work-life balance, the company engaged employees with Ultimate Interest Group Challenges throughout October. This year's activities included badminton, cycling, futsal, pool, running, table tennis, cooking and baking, and eco-gardening. These initiatives not only foster teamwork but also reflect a holistic approach to supporting employees' overall well-being.

Through these efforts, ams OSRAM is cultivating a supportive culture that values mental health and empowers everyone to thrive!

Wellness Wonderland

Group photo from a wellness event for employees, organized with our medical partners.

Futsal with Dad

Group photo of employees participating with their children and families.

Eco Garden

CEO, Aldo Kamper, trimming cucumbers.

Flower plot landscaped by employees.

Mother's Day Fair

Florian praising our operator Siti (in pink baju) for preparing a table full of culinary delights. The fair featured over a dozen booths showcasing homemade food and handmade crafts by our employees.

Cycling Adventure

Interest group cycling during one of their planned adventures exploring various parts of Singapore.

Badminton Tournament

Interest group participating in their twice-weekly friendly badminton matches.

Baking & Cooking

Interest group at an external mooncake-making workshop.

Recreation Corner

The Recreation Corner is open 24/7, allowing employees from all shifts to relax during breaks.

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