
Company Profile

Background

SEMICAPS was founded in 1989 by lecturers from the National University of Singapore (NUS) with the mission to commercialize research innovations. The company specialized in products and techniques for the failure analysis (FA) of semiconductor devices. SEMICAPS designed and manufacture image capture and enhancement accessories for a scanning electron microscope and sold more than 400 units worldwide. We were also the appointed sales and service distributor for Hitachi SEM. The name **SEMICAPS** is an acronym for Scanning Electron Microscope Image Capturing and Processing System. The early foundation shaped our DNA in innovation, design, manufacturing, global reach, service and most importantly, and working with industry, partners and academia to innovate and solve real world industry driven problems.

Today, SEMICAPS is a world's leading company specializing in the design and manufacture of world leading fault localization laser scanning optical microscopes. These tools are used by the top semiconductor companies and laboratories around the world. Our equipment plays a critical role in fault isolation (FI) and failure analysis (FA) processes enabling customers to, efficiently and quickly, ramp up the yield of their latest chip designs by analyzing and locating faults in their engineering samples and early production runs.

Our microscopes are typically used for:

- a) design-debug analysis of new integrated circuits (ICs),
- b) yield improvement analysis for early semiconductor wafers
- c) failure analysis of customer returns
- d) advanced packaging and packing failures
- e) FA and FI services provided by third party labs, research institutes, higher education and governments

Our highly experienced in-house technical and R&D teams possess deep expertise in both hardware and software, along with a strong understanding of the semiconductor industry's evolving application requirements. At SEMICAPS, we invest heavily in research and development to meet our customers' needs and drive innovation in our technology roadmap. Our tools are fully qualified and actively used in advanced semiconductor nodes, including 7nm, 5nm, 3nm, and beyond.

Our key advantage over our competitors includes:

- a) the ability of our microscopes to resolve linewidths below 80 nm and below 160nm pitch, thereby producing the highest resolution images, smallest laser spot size, working with the most advanced tech nodes, 3nm, 2nm and beyond as well as mature tech nodes.
- b) the ability of our analytical wafer prober (SEMICAPS 5000) to allow hard-docking and direct-probing with standard production and commercial testing equipment; catering for probe-cards of over 10,000 pins and testing speeds of more than 1 Gbps.
- c) customized to our customer's specific needs through many collaborations, commercializing many world's firsts, superior hardware, better techniques, providing long term upgradability and reliability through our modular platform with very cost-efficient ownership.

SEMICAPS' R&D efforts have led to the grant of nine patents, along with numerous trade secrets and proprietary manufacturing processes that underpin the performance of our industry-leading tools. In recognition of these significant achievements, the SEMICAPS team was awarded the prestigious **Singapore President's Technology Award** in 2009 — the nation's highest honor for contributions to science and technology.

SEMICAPS was also proudly featured as the **very first NUS spin-off** in "*A History of NUS in 12 Objects*", published in the *AlumNUS* magazine (July–December 2025), commemorating the National University of Singapore's 120th anniversary. This recognition highlights our role in bridging academia and industry, and our place in NUS's storied history.

Some of our customers include AMD, TSMC, Qualcomm, Intel, ARM, Microsoft, Samsung, On Semi, Skyworks, TI, Micron, UMC, NXP and Global Foundries. Over half the top 10 semiconductor companies have bought our machines. Government, research and educational institutions from USA, Singapore, China, and India have also purchased our instruments.

Patents

- 24 May 2005 - Laser Beam Induced Phenomena Detection (TBIP)
- 25 Nov 2008 - Method and System for Measuring Laser Induced Phenomena Changes in a Semiconductor Device (DreM)
- 24 Nov 2009 - Method of Testing an Electronic Circuit and Apparatus Thereof (Pulsing, Laser Induced)
- 06 Dec 2011 - Solid Immersion Lens Optics Assembly (SIL)
- 20 Oct 2012 - Method and System for Measuring Laser Induced Phenomena Changes in a Semiconductor Device (VBA)
- 07 May 2013 - Wafer Stage
- 18 Nov 2014 - Apparatus and Method for Cooling A Semiconductor Device (Cooling)
- 25 Jul 2017 – AT-Speed Integrated Circuit Testing Using Through Silicon In-Circuit Logic Analysis (ODLA)
- Many in house trade secrets- process and manufacturing technologies not reveled in patents

Our Products

- Housing Configurations: SEMICAPS 1100, SEMICAPS 1300 (dual column), SEMICAPS 1500 (Large Platform), SEMICAPS 3000/3300 (tester docked), SEMICAPS 4000 (tester docked with front side probe station), SEMICAPS 5000 (Analytical Wafer Prober)
- Techniques: PEM (SWIR), Thermal Lock-in (MWIR), SOM (static OBIRCH, TIVA, LIVA, OBIC, etc and dynamic LADA, SDL), laser probing (LTP/FM)
- Select any combination of techniques to be housed in preferred configuration
- ARSIL, AuriCool, High-Voltage Platform for GaN, SiC, etc

SEMICAPS Group of Companies

Inscope Labs Pte. Ltd.

- Inscope Labs is part of the SEMICAPS Group of Companies, as an independent full-service turnkey Failure Analysis and Analytical Services Laboratory (ISO 9001/IPC A-610 Certified)
- Incorporated in 2000 to provide prompt, reliable and cost-effective analytical services for the semiconductor, life sciences, electronics, disk drive, metallurgy, oil and gas and other industries
- Over 50+ active customers from Singapore, USA, Malaysia, Thailand, Philippines, India, Indonesia, Israel, UK, Australia, etc.

SEMICAPS Research Labs Pte. Ltd.

- SEMICAPS Research Labs (SRL) is owned by SEMICAPS Pte. Ltd. and part of the SEMICAPS Group of companies as a 100% focused research-based entity providing research and development in fault localization, defect characterization and metrology for semiconductors
- Incorporated in 2026, the vision of SRL is to use our expertise in electrical, optical, mechanical, software and AI to enhance our products and solutions for the customer
- SRL partners with industry, academia, research institutes and other businesses to fulfill our vision
- In the future, SRL will also look at techniques that include X-Ray and other leading edge technologies to innovate new solutions for new chip architecture and technology nodes

SEMICAPS Ventures Pte. Ltd.

- SEMICAPS Ventures was incorporated in 2025 with a group of individuals with diverse backgrounds with a core purpose of making strategic investments and provide consulting services for the semiconductor space
- The team has over a combined 200 years of experience in the semiconductor industry

SEMICAPS China Wuxi

- SEMICAPS China Wuxi was incorporated in 2026 as a joint venture with Unicom Group (SHSE: 688531), a public listed company on the Shanghai Stock Exchange and the SEMICAPS Group
- SEMICAPS China Wuxi operates independently as a full-fledged facility with a factory for manufacturing, offices and staff for customer support, applications support, and sales serving the China domestic market solely
- This investment affirms our commitment to the growing domestic market in China and leveraging the support and reputation of the Unicom Group

Websites and Contacts

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