NANOTS 2025

The 45th Annual NANO Testing Symposium

Senri Life Science Center
(Toyonaka, Osaka, Japan)

11–13 November 2025

https://inanot.sakura.ne.jp/nanots/

secretariat@inanot.sakura.ne.jp

Sponsored by The Institute of NANO Testing

In cooperation with

- The Institute of Electronics, Information and Communication Engineers
- The Japan Society of Applied Physics
- Reliability Engineering Association of Japan
- Union of Japanese Scientists and Engineers

Contents

1 Location

Technical Sessions:

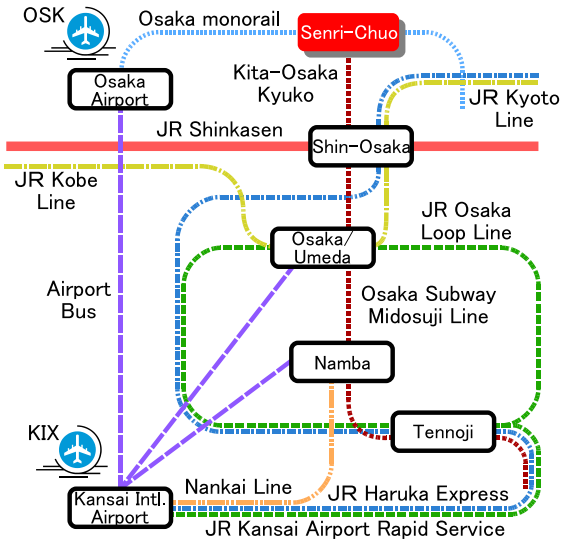
Life Hall, the 5th floor, Senri Life Science Center
1-4-2, Shin-Senri-Higashi-Machi, Toyonaka
Osaka, 560-0082 JAPAN
Phone: +81-6-6873-2010, FAX: +81-6-6873-2011

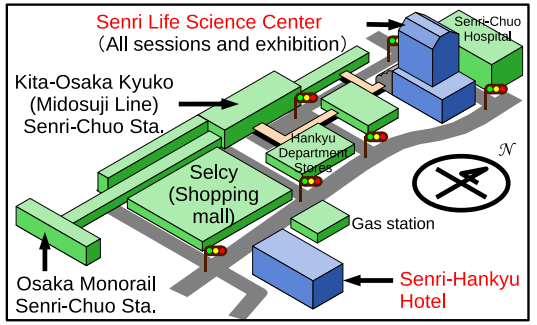
Exhibition:

Senri Room, the 6th floor, Senri Life Science Center

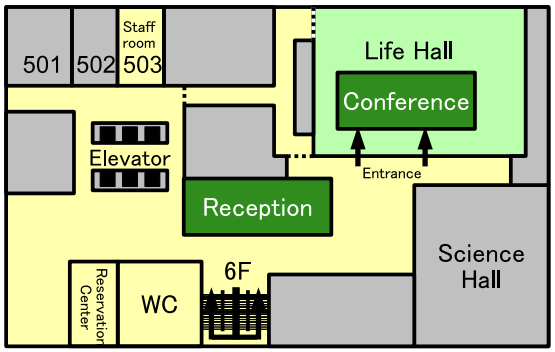
Evening Session:

Life Hall, the 5th floor, Senri Life Science Center

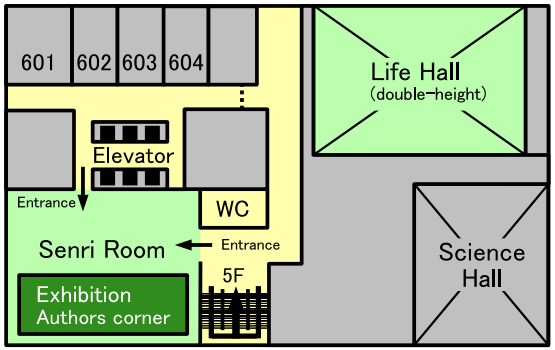




2 Floor Map



Senri Life Science Center 5F



Senri Life Science Center 6F

3 Invited Talk

The following invited talks will be given.

13:30–14:30, Tuesday, 11 November:

"Generative AI-assisted knowledge building for equipment and maintenance, and developing maintenance applications"

by Dr. Tomoaki HIRUTA, *Hitachi, Ltd.*

13:26–14:26, Wednesday, 12 November:

"The Invisible Force Behind Rapidus' Challenge and Innovation — The True Value of Inspection and Measurement Technologies"

by Dr. Hiroshi AKAHORI, *Rapidus Co., Ltd.*

09:30–10:30, Thursday, 13 November:

"Fundamentals and Trends of Semiconductor Quantum Bit Research"

by Prof. Tetsuo KODERA, *Institute of Science Tokyo*

4 Tutorial Session

The following tutorial sessions will be given.

13:15–15:15, Thursday, 13 November:

"Visualization Technology for Lattice Defects Distributed over the Entire Surface of a Semiconductor Wafer"

by Prof. Yongzhao YAO, *Mie University*

5 Authors Corner

Authors corner, a place for audience to meet with and discuss with authors, will be given just after the sessions (except for commercial sessions) in Senri room on 6F.

6 Evening Session

Evening session of NANOTS is a special session for introducing recent activities related to semiconductor failure analysis technology in JEITA and REAJ and discussing on research trend around the world and the future perspective. The session will be held on 18:00–20:00, Wednesday, 12 November. (Life Hall on 5F).

7 Exhibition and Commercial Session

The Symposium will feature the latest in service providers, equipment manufacturers and suppliers. A large exhibit floor will give the opportunity to key-vendors to represent the core business area in these fields. Furthermore, a commercial session will give the opportunity to introduce new products with short presentation.

8 Luncheon Seminar

Luncheon seminars will be given in lunch break time. You must pre-register to attend the seminar. In some cases, your registration may not be accepted because of a business policy of the sponsor.

Hitachi High-Tech Luncheon Seminar: Tuesday, 11 November

Theme: Introduction to Hitachi's Latest In-Lens FE-SEM SU9600

Abstract : Combining the Highest Resolution with High Throughput: Introducing Hitachi's Flagship Model SU9600, Supporting Semiconductor Research.

JEOL Luncheon Seminar: Wednesday, 12 November

Theme: Semiconductor Analysis Empowered by JIB-PS500i and JEM-ACE200F

Abstract : Introducing the Expanding Possibilities of Semiconductor Nanostructure Analysis through FIB-SEM and TEM.

9 Official Languages

The official languages of the symposium are Japanese and English. Papers included in the proceeding will be written in Japanese or English. Papers in Japanese will have an abstract written in English. We will have no interpreter.

10 Registration Fee

Course	Fee	Including
Non-student	JPY 13000	All sessions, exhibition, and proceeding (download only)
Student	JPY 5000	

Please pay the fee by 24 October 2025 in one of the following ways.

Wire Transfer: Please send Japanese YEN (JPY) to the following account by wire transfer:

Bank Name: Resona Bank, Ltd.
SWIFT (BIC) Code: DIWAJPJT
Branch Name: Senri-Kita Branch
Branch Code: 222
Address: 4-2-D2-201, Furuedai, Suita, Osaka, 565-0874, Japan
Phone: +81-6-6872-0651
Account Number: 6843152
Account Name: The Institute of NANO Testing Nakamae Koji
Note: All bank charges JPY 5,000 (= the sending bank charge + the receiving bank charge) must be paid by the participant.

Credit card: After you register on the web, the secretariat

will send information on how to pay the registration fee by credit card to your e-mail address.

11 Symposium Registration

Please register on line by using our following website by 24 October 2025 (punctuality).

https://inanot.sakura.ne.jp/nanots/en/

This symposium is for pre-registration only, and we will not accept participation on the day. Thank you for your understanding.

12 Cancellation Policy

Cancellations must be submitted in an e-mail. Cancellations received by 17:00, 24 October 2025 (in Japan Standard Time) are entitled to a refund minus an administrative fee (all bank charges plus a 10 % processing fee). No refunds will be given to registrants who cancel after 24 October 2025 or who fail to attend the event.

13 Accommodation Information

There is Senri Hankyu Hotel around the symposium site. The hotel is located close to the symposium site. You can go to the symposium site from the hotel by 5 minutes walk. If you want to stay at Senri Hankyu Hotel, please visit the hotel's web site and book a room. Please keep in mind that the reservation will be closed in the case all available rooms are booked.

http://www.senri-htl.co.jp/

14 Proceedings

Technical papers will be provided on electronic media (download). Download information will be announced on November 6, 2025. The conference program will be provided on print media.

15 Latest Information

You can find latest information on all aspects of NANOTS at https://inanot.sakura.ne.jp/nanots/en/ .

16 Steering & Program Committee

Chairman:

Koji NAKAMAE	(The University of Osaka)

Member:

Shunsuke ASAHINA	(JEOL.Ltd.)
Yasuo CHO	(Tohoku University)
Yasuhisa HIGUCHI	(Hitachi, Ltd.)
Kazunobu KOJIMA	(The University of Osaka)
Toru KOYAMA	(Fuji Electric Co., Ltd.)
Hitoshi MAEDA	(Renesas Electronics Corp.)
Hideo MORISHITA	(Hitachi. Ltd.)
Kiyoshi NIKAWA	(Device Evaluation Technology Lab.)
Makoto SAKAKIBARA	(Hitachi High-Tech Corp.)
Hirotoshi TERADA	(Hamamatsu Photonics)
Masahiko TSUJITA	(Sony Semiconductor Manufacturing Corp.)
Yuichiro YAMAZAKI	(TASMIT Inc.)
Yuki WAKISAKA	(Kioxia Corp.)

17 Secretariat

Yoshihiro MIDOH and Koji NAKAMAE
Secretariat of the Institute of NANO Testing
Miura Lab., Dept. Information Systems Engineering,
Grad. Sch. Information Science and Technology
The University of Osaka
1-5, Yamada-Oka, Suita, Osaka, 565-0871 JAPAN
Phone/Fax: +81-6-6879-7813 / +81-6-6879-7812
E-mail: secretariat@inanot.sakura.ne.jp
Web: https://inanot.sakura.ne.jp/nanots/en/

18 Technical Program

Tuesday, Nov. 11, a.m. / Life Hall

(1) *09:20* Opening remarks
K. Nakamae / The Institute of NANO Testing

Preprocessing a.m., Tue 11

Chairman Masahiko Tsujita

(2) *09:30* Advances in X-ray Source Technology for High-Resolution nanoCT in Semiconductor Packaging Inspection
N. Seimiya[a], N. Achilles[b], L. Michalewicz[b], D. Stickler[b] / [a]Comet Technologies Japan K.K., [b]Comet Yxlon GmbH

(3) *09:55* The Silicon Thinning Process by using Inward Plasma
C. Iwase, R. Kanou, Y. Shirayama, S. Takahashi / Sanyu Co.,Ltd.

····· 10:20〜10:40 Authors corner & break ·····

Metrology and Inspection I a.m., Tue 11

Chairman Toru Koyama

(4) *10:40* Defect Extraction Model Using Schlieren Images in Wafer Back Side Grinding Process
G. Kataoka, K. Komenaka, T. Yokoi, M. Kimoto, R. Furusawa, O. Yamane / KIOXIA Corporation

(5) *11:05* False Positive Discrimination Technology Using Contrastive Learning for Image Inspection of Semiconductors
Y. Azuma[a], M. Ouchi[b], H. Shindo[c], K. Fukaya[c] / [a]Hitatchi, [b]Hitachi, [c]Hitachi High-Tech

(6) *11:30* Development of Technology to Identify Defect Depths in Ultra-sonic Void Inspection
H. Takayanagi[a], Y. Okada[a], H. Tamura[a], A. Hamaguchi[a], Y. Xiong[b], S. Nishiyama[b] / [a]KIOXIA Corporation, [b]Sandisk G.K

····· 11:55〜12:15 Authors corner & break ·····

Luncheon seminar a.m., Tue 11

(L1) *12:15* Hitachi High-Tech Luncheon seminar
H. Ito, Y. Nakajima / Hitachi High-Tech

Tuesday, Nov. 11, p.m. / Life Hall

Invited Talk I — p.m., Tue 11

Chairman Hideo Morishita

(I1) *13:30* Generative AI-assisted knowledge building for equipment and maintenance, and developing maintenance applications
T. Hiruta / Hitachi, Ltd.

····· 14:30～14:50 Authors corner & break ·····

Artificial intelligence — p.m., Tue 11

Chairman Hirotoshi Terada

(7) *14:50* AI-Powered Knowledge Management for Nano Testing: A Large Language Model Approach
Y. Midoh / The University of Osaka

(8) *15:15* Application of SEM Image Generation AI Models to Dimensional Measurement of Semiconductor Patterns
S. Nakamichi, Y. Midoh, S. Asano, J. Shiomi, N. Miura / The University of Osaka

····· 15:40～16:00 Authors corner & break ·····

Metrology and Inspection II — p.m., Tue 11

Chairman Yuki Wakisaka

(9) *16:00* Advanced pattern contour extraction function for see-through BSE images of high voltage SEM
M. Oya[a], Y. Okamoto[a], S. Nakazawa[a], K. Maruyama[a], Y. Yamazaki[a], S. Murakami[b], Y. Midoh[b], N. Miura[b] / [a]TASMIT, Inc., [b]The University of Osaka

(10) *16:25* Effectiveness Evaluation of Contour Extraction Approaches for SEM Images of Semiconductor Multilayer Patterns
S. Murakami[a], M. Oya[b], Y. Okamoto[b], S. Nakazawa[b], K. Maruyama[b], Y. Yamazaki[b], Y. Midoh[a], N. Miura[a] / [a]The University of Osaka, [b]TASMIT, Inc.

····· 16:50～17:10 Authors corner & break ·····

Wednesday, Nov. 12, a.m. / Life Hall

Equipment and systems — a.m., Wed 12

Chairman Shunsuke Asahina

(11) *09:30* In-situ SEM Nanoscale Mechanical Testing for Characterizing Single-Walled Carbon Nanotubes
T. Namazu / Kyoto University of Advanced Science

(12) *09:55* Correlative analysis between SEM voltage contrast imaging and AFM local electric propery measurement
T. Aiso, T. Sunaoshi, S. Takeuchi / Hitachi High-Tech Corporation

····· 10:20～10:40 Authors corner & break ·····

Commercial Session — a.m., Wed 12

Chairman Hitoshi Maeda

(C1) *10:40* Introduction to Alps Alpine's Semiconductor Design Capabilities
Y. Hattori / IC Engineering Dept.

(C2) *10:47* Hamamatsu Photonics TD Imaging, a new method for thermal measurement using Emission Microscopy.
K. Koshikawa / TOKI COMMERCIAL CO.,LTD.

(C3) *10:54* Introduction of Zoom Scan for High-Resolution CT Imaging
N. Seimiya[a], N. Achilles[b], L. Michalewicz[b] / [a]Comet Technologies Japan K.K., [b]Comet Yxlon GmbH

(C4) *11:01* Recent Enhancements of LAVIS-plus for Failure Analysis
T. Imoto / TOOL Corporation

(C5) *11:08* Imina Technologies Application of Nanoprobing Method to Semiconductor Device Failure Analysis
Y. Nakayama / APOLLOWAVE Corporation

(C6) *11:15* Optimized Prober Shuttle for Failure Analysis Applications
S. Kamada, K. Takahashi / AD Science Inc.

(C7) *11:22* Introduction of Semiconductor Device Failure Localization Method LI EBAC
T. Shimamori, J. Fuse, Y. Nara, N. Bito / Hitachi High-Tech Corporation

(C8) *11:29* The Thermo Fisher Scientific MK4 ESD Simulator and Latch-Up Tester Provides the Highest Throughput and Most Extensive Features in Industry
S. Nohara[a], M. Hernandez[b], T. Meuse[b], H. Tanaka[b] / [a]The OYAMA Company, [b]Thermo Fisher Scientific

(C9) *11:36* Introducing new functions of the CAD navigation system "AZSA-HS"
S. Isa / Sales

(C10) *11:43* Real-time dedicated 4D-STEM; TENSOR
S. Taga, Y. Kodama, N. Suzuki / TOYO Corporation

(C11) *11:50* Introducing the High-End FE-SEM ¡JSM-IT810¿ with Newly Developed Enclosure and Automation Features
Y. Uetake / JEOL

(C12) *11:57* The Thermo Fisher Scientific Talos F200E (S)TEM Efficiency and Reliability for Each Sample
M. Schneider, H. Lin, H. Tanaka / Thermo Fisher Scientific

(C13) *12:04* SiC Power Device AC-BTI Test
K. Takamori / Oki Engineering Co., Ltd.

Luncheon seminar — a.m., Wed 12

(L2) *12:11* JEOL Luncheon seminar
I. Kawano, N. Endo / JEOL

Wednesday, Nov. 12, p.m. / Life Hall

Invited Talk II — p.m., Wed 12

Chairman Yuichiro Yamazaki

(I2) *13:26* The Invisible Force Behind Rapidus' Challenge and Innovation — The True Value of Inspection and Measurement Technologies
H. Akahori / Rapidus Co., Ltd.

····· 14:26～14:31 Group Photo ·····

····· 14:31～14:46 Authors corner & break ·····

Metrology and Inspection III p.m., Wed 12

Chairman Kiyoshi Nikawa

(13) *14:46* Electrical Property Estimation Using an Electron Microscope
S. Soraya[a], N. Yohei[a], S. Minami[a], O. Kazuo[b] / [a]HITACHI.LTD, [b]Hitachi High-Tech Corporation

(14) *15:11* Electrical Characterization of Semiconductor Devices using Transient Analysis of Secondary Electrons in SEM
S. Minami[a], Y. Shirasaki[a], Y. Nakamura[a], K. Yachi[b] / [a]Hitachi Ltd,., [b]Hitachi High-Tech Corp.,

(15) *15:36* In-situ SEM observation of electron beam-induced local electrical actuation of MOSFETs using GaN semiconductor-based photoelectron beam technology
T. Nishtiani[a], D. Sato[a], Y. Arakawa[a], K. Niimi[a], A. Koizumi[a], H. Iijima[a], Y. Honda[b], H. Amano[b] / [a]Photo electron Soul Inc., [b]Center for Integrated Research of Future Electronics, Institute of Materials and Systems for Sustainability, Nagoya University

····· 16:01～16:21 Authors corner & break ·····

Evening Session p.m., Wed 12

18:00 – *20:00* Evening session of NANOTS is a special session for discussing on research trend around the world and the future perspective. This session will be held at Life Hall, Senri Life Science Center 5F.

Chairman Koji Nakamae

····· 18:00～18:20 NANOTS2024 Awards etc. ·····

Recent activities related to semiconductor failure analysis technology in JEITA (Japan Electronics and Information Technology Industries Association) and REAJ (Reliability Engineering Association of Japan)
K. Nikawa / Device Evaluation Technology Laboratory

····· 20:00 Close ·····

Thursday, Nov. 13, a.m. / Life Hall

Invited Talk III a.m., Thu 13

Chairman Yasuhisa Higuchi

(I3) *09:30* Fundamentals and Trends of Semiconductor Quantum Bit Research
T. Kodera / Institute of Science Tokyo

····· 10:30～10:50 Authors corner & break ·····

Metrology and Inspection IV a.m., Thu 13

Chairman Makoto Sakakibara

(16) *10:50* Comprehensive Analysis of High-bandwidth Memory (HBM) with Helios 5 Laser PFIB: Integrating 2D High-Resolution SEM Imaging and 3D Metrology
H. Lin, X. Hu, A. S. Hall, J. Zhou, R. Dai, V. Yang / Thermo Fisher Scientific

(17) *11:15* Assessment of topography metrology using in-line SEM
A. Hiroaki, I. Chihiro, T. Hironobu, H. Akira / KIOXIA Corporation.

····· 11:40～12:00 Authors corner & break ·····

····· 12:00～13:15 Lunch Break ·····

Thursday, Nov. 13, p.m. / Life Hall

Tutorial p.m., Thu 13

Chairman Kazunobu Kojima

(T1) *13:15* Visualization Technology for Lattice Defects Distributed over the Entire Surface of a Semiconductor Wafer
Y. Yao / Mie University

····· 14:15～14:35 Authors corner & break ·····

Physical Analysis p.m., Thu 13

Chairman Yasuo Cho

(18) *14:35* Chemical state observation using photomission electron microscopy
T. Taniuchi, H. Fujiwara, M. Okawa, C. Bareille, S. Shin / The university of Tokyo

(19) *15:00* A new method for visualizing local structure distribution in amorphous materials: nanoscale analysis by combining STEM-EELS and deformation distance indices
Y. Yuzawa, T. Asano, K. Nakamura, Y. Aiba, D. Hagishima, H. Tanaka / Kioxia Corp.

····· 15:25～15:45 Authors corner & break ·····

Power Device Analysis p.m., Thu 13

Chairman Kiyoshi Nikawa

(20) *15:45* Visualization of low concentration diffusion layers in power semiconductor devices using TCAD simulation
T. Oyama / Fuji Electric Co.,Ltd.

(21) *16:10* Evaluation of the Effectiveness of "Spectrum Image" Using Auger Electron Spectroscopy for SiC Device Analysis
K. Ikita, F. Nabeshima, T. Uchida, N. Taguchi, A. Tanaka, T. Ohama, K. Yokouchi, K. Tsutsumi / JEOL Ltd.

(22) *16:35* Local DLTS/CV profiling of a SiO_2/SiC interface by variable-temperature scanning nonlinear dielectric microscopy
K. Yamasue / Tohoku University

····· 17:00～17:20 Authors corner & break ·····

(23) *17:20* Closing remarks
K. Nakamae / The Institute of NANO Testing

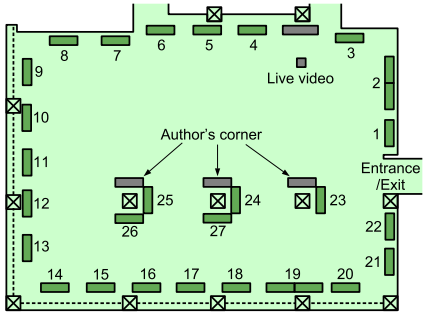
19 Author Index

※ Numbers show presentation numbers in the technical program.

20 Exhibition

Date & time:
Tuesday, 11 November 2025, 13:00–17:00
Wednesday, 12 November 2025, 9:30–17:00
Thursday, 13 November 2025, 9:30–16:00

Venue: Senri room on 6rd floor



(The exhibition floorplan is subject to change without notice.)

1. ITES Co.,Ltd.:
   Introduction of power semiconductor evaluation and analysis
2. Thermo Fisher Scientific: (C8, C12)
   Thermo Fisher Scientific
3. Marubun Corp.:
   Marubun failure analysis solution
4. Qualtec Co.,LTD:
   Evaluation of Micro VIA Junction Vulnerability of Advanced Semiconductor Package Substrates
5. Toshiba Nanoanalysis Corp.:
   Nano-level physical analysis of semiconductors
6. YAMAZEN Corp.:
   High-Precision Laser Marking/Ultra-High Magnification Optical Microscope
7. Hanwa Trading Corp.:
   Signatone, semiconductor inspection equipment
8. Oki Engineering Co., Ltd.: (C13)
   SiC Power Device AC-BTI Test
9. Nippon Scientific Co. Ltd.:
   Valid Decapsulation systems
10. AD Science Inc.: (C6)
    Nano probing system for failure analysis using SEM/FIB
11. APOLLOWAVE Corp.: (C5)
    Imina Technologies Nano Probing Solutions
12. Hitachi High-Tech Corp.: (C7)
    Innovation, Synergy, Solutions -New EM Lineup
13. Nippon Barnes Co., Ltd.:
    TDM_Warpage and CTE measurement during thermal profile
14. INABATA & Co., Ltd.:
    Scalable Raman smart sensor ‘Raman Eye’ and Temperature system ’MPI Thermal Air’

15. SEIKO FUTURE CREATION INC.:
    Advanced Techniques in IC Circuit Repair: ”FIB Modifications” and ”3D Cross-Sectional Analysis for Foreign Object Detection using FIB/TEM”
16. Sanyu Co.,Ltd.:
    Introduction of Our Products Centered on “ELLMID,” a Local Polishing Machine for Semiconductor Devices
17. Tool Corp.: (C4)
    Recent Enhancements of LAVIS-plus for Failure Analysis
18. TOKI COMMERCIAL CO., LTD: (C2)
    A new method TD Imaging for thermal measurement using Emission Microscopy.
19. Hamamatsu Photonics K.K.:
    Luminescent materials measurement system, Laser engine for FIB-SEM, Charge neutralization light source, Semiconductor failure analysis systems
20. Plasma-Therm-Japan K.K.:
    Dry Etching Removal System with Endpoint Detection Function for Failure Analysis of Wafers, Chips, and Packaged Dies
21. TOYO Corp.: (C10)
    Dedicated real-time 4D-STEM & BIB integrated FIB-SEM
22. Astron,Inc.: (C9)
    CAD navigation system ”AZSA-HS”
23. JEOL Ltd.: (C11)
    Failure analysis using electron microscope
24. ALPSALPINE: (C1)
    Alps Alpine’s Semiconductor Design Capabilities
25. Comet Technologies Japan K.K.: (C3)
    High-Resolution CT Imaging Using Zoom Scan
26. SEMILAB JAPAN KK:
    For all your Metrology Needs
27. LTEC corporatoin:
    Semiconductor Analysis service

21 List of Associate Members

(in alphabetic order, 27 October 2025)

- AD Science Inc.
- ADVANTEST CORPORATION
- AlpsAlpine Co., Ltd.
- AMETEK Co. Ltd.
- APOLLOWAVE Corp.

- Applied Materials, Inc.
- ASTRON Inc.
- ATE Service Corp.
- Carl Zeiss Co.,Ltd.
- Comet Technologies Japan K.K.
- Excillum AB
- FEI Company Japan Ltd.
- Hamamatsu Photonics K.K.
- Hanwa Trading Corp.
- HiSOL, INC.
- Hitachi High-Tech Corporation
- INABATA & Co.,Ltd.
- IR System Co., Ltd.
- ITES CO., Ltd.
- JEOL Ltd.
- LTEC Co.
- MARUBUN CORPORATION
- MA-tek Japan Inc.
- Nano Tech Solutions Inc.
- NIKON SOLUTIONS CO., LTD.
- Nippon BARNES Company, Ltd.
- Nippon Scientific Co., Ltd
- Oki Engineering Co., Ltd.
- Plasma-Therm-Japan K.K.
- Qualtec Co., Ltd.
- Sanyu Co.,Ltd.
- SEIKO FUTURE CREATION INC.
- Semilab Japan
- TASMIT, Inc.
- Toki Commercial Co., Ltd.
- TOOL CORPORATION
- Toshiba Nanoanalysis Corporation
- TOYO Corporation
- Yamazen Corporation