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NANOTS 2015
The 35th Annual NANO Testing Symposium

Senri Life Science Center
(Toyonaka, Osaka, Japan)
11–13 November 2015
http://www-NANOTS.ist.osaka-u.ac.jp/
NANOTS@ist.osaka-u.ac.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
### 2 Location

**All 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:**
Crystal Hall, Senri Hankyu Hotel
2-1-D-1, Shin-Senri-Higashi-Machi, Toyonaka Osaka, 560-0082, JAPAN
Phone: +81-6-6872-2211, Fax: +81-6-6832-2161

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#### 12 (Thu)

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<th>Time</th>
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#### 13 (Fri)

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</table>
3 Special Invited Talk

A special invited talk “True nanoscale resolution of IC debug & diagnosis — challenge to signal sensitivity and device preparation” will be given by Prof. Dr. C. Boit (Technische Universität Berlin) on Thursday, 12 November 17:20~18:20.

4 Invited Talk

The following invited talks will be given.

Wednesday, 11 November : Prof. Norio NAKATSUJI “Large-scale cell production by using pluripotent stem cells (ES/iPS cells): Quality control of cell culture system and cell products” (Professor Emeritus, Kyoto University, Institute for Integrated Cell-Material Sciences and Institute for Frontier Medical Sciences, Vice President, NPO Kyoto SMI, Director, Chief Adviser, Kyoto Stem Cell Innovation, Inc., and Stem Cell & Device Laboratory, Inc.).

Thursday, 12 November : Prof. Kyuuichiro SANO “Innovation for future data-driven society based on CPS (cyber physical system) (Tentative)” (Director, Information Economy Division, Commerce and Information Policy Bureau, Ministry or Economy, Trade and Industry).

Friday, 13 November : Prof. Eizo NAKAMURA “Establishment of Comprehensive Analytical System for Terrestrial and Extraterrestrial Materials (CASTEM) and its applications” (Institute for Study of the Earth’s Interior Okayama University at Misasa).

5 Panel Session

A panel session discussing on “Dopant Visualization” will be held on Friday, 13 November 16:05~17:35.

6 Poster Session

A poster session will be held on 12 Nov. 15:10~16:10 in Senri-room (6F). Short (1min) oral presentation of the poster session papers will be given on the same day 11:59~12:13 in the conference hall (Life-hall, 5F).

7 Authors Corner

Authors corner, a place for audience to meet with and discuss with authors, will be given just after the sessions (except for special and commercial sessions).

8 Evening Session

Evening session of NANOTS is a special session for discussing on research trend around the world and the future perspective. The session will be held on the Thursday night with a buffet-style dinner in the Senri Hankyu hotel. Course A registration fee includes one ticket to the evening session of NANOTS.

9 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 (second & third days). Furthermore, a commercial session will give the opportunity to introduce new products with short presentation (second day).

10 Luncheon Seminar

Luncheon seminars will be given by Hitachi High-Technologies Corporation and Hamamatsu Photonics K.K. in lunch break time on Nov. 11 and 12, respectively. A meal is provided in these seminars. You must pre-register to attend these seminars. In some cases, your registration may not be accepted because of a business policy of the sponsors.

Hitachi High-Technologies Luncheon Seminar: Wednesday, 11 Nov.

Hamamatsu Photonics Luncheon Seminar: Thursday, 12 Nov.

Theme: Recent topics on Hamamatsu Photonics
Abstract: Technology development by Hamamatsu photonics in the past year and failure analysis case studies will be introduced.

11 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.

12 Registration Fee

<table>
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<tr>
<th>Course</th>
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<tr>
<td>A</td>
<td>¥18,000</td>
<td>All sessions, proceeding (book and electronic media), exhibition, and Evening session</td>
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<td>Student</td>
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<tr>
<td>B</td>
<td>¥10,000</td>
<td>All sessions, proceeding (book and electronic media), and exhibition</td>
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<td>Student</td>
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Please pay the fee by either of the following methods.

Wire Transfer: Please send Japanese YEN (JPY) to the following account by wire transfer not later than 31 October 2015:

Bank Name: Resona Bank, Ltd.
SWIFT (BIC) Code: DIWJJPJT
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.
Cash: Please pay at the registration desk during the symposium dates. Only Japanese YEN (JPY) is acceptable.
Credit card: Please contact to the symposium secretariat, if you want to pay the registration fee by credit card (PayPal).

13 Symposium Registration

We strongly encourage you to register online by using our website: http://www-NANOTS.ist.osaka-u.ac.jp/ by 30 October 2015.

14 Cancellation Policy

Cancellations must be submitted in writing. Cancellations received by November 6, 17:00 (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 November 6, 2015 or who fail to attend the event.
15 Accommodation Information

There is Senri Hankyu Hotel around the symposium site. The hotel is located close to the symposium site and the Evening Session will be held in the hotel. 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-hkt.co.jp/

16 Latest Information

You can find latest information on all aspects of NANOTS at http://www-NANOTS.ist.osaka-u.ac.jp/.

17 Steering & Program Committee

Chairman:
Koji NAKAMAE
(Osaka University)

Member:
Yasunori GOTO
(Toyota Motor Corp.)
Yasuhashi HIGUCHI
(Hitachi Power Semiconductor Device, Ltd.)
Toru KOYAMA
(Renesas Semiconductor Manufacturing Co., Ltd.)
Yoji MASHIKO
(Oita University)
Motosuke MIYOSHI
(University of Tokyo)
Kiyoshi NIKAWA
(Kanazawa Institute of Technology)
Kenji NORIMATSU
(Toshiba Corp.)
Yoichio OSE
(Hitachi High-Technologies Corp.)
Mitsuo SUGA
(JEOL, Ltd.)
Hirotoshi TERADA
(Hamamatsu Photonics)
Yuichiro YAMAZAKI
(NGR Inc.)
Ichiro YOSHII
(DCG Systems G.K.)

18 Secretariat

Katsuyoshi MIURA and Yoshihiro MIDOH
Secretariat of the Institute of NANO Testing
Nakamae Lab., Dept. Information Systems Engineering,
Grad. Sch. Information Science and Technology
Osaka University
2-1, Yamada-Oka, Suita, Osaka, 565-0871 JAPAN
Phone/Fax: +81-6-6879-7813 / +81-6-6879-7812
E-mail: NANOTS@ist.osaka-u.ac.jp
Web: http://www.NANOTS.ist.osaka-u.ac.jp/

19 Technical Program

Wednesday, Nov. 11, a.m.

Process Evaluation Techniques & Metrology
and Inspection I

Chairman Motosuke Miyoshi

(1) Approaches to the metrology challenges for DSA hole
M. Asano, K. Matsuki, T. Ojima, H. Yonemitsu,
A. Kawashima, and M. Sato / Lithography Process
Technology Dept., Center for Semiconductor Research &
Development, Toshiba

(2) Patterned mask inspection technology with projection electron microscope technique for 11 nm half-pitch generation EUV masks
S. Iida, R. Hirano, T. Amano, and H. Watanabe / Advanced mask Research Dept., EUVL Infrastructure Development Center, Inc. (EIDEC)

(3) Assess a possibility of high sensitive EB inspection for bottom defects in HAR devices.
Y. Iida(a), A. Hamaguchi(b), and C. Ida(b) / 
Analysis Inspection and Metrology Engineering Dept.,
Semiconductor & Strage Company, Toshiba Corp.,
Manufacturing Engineering Dept. II, Semiconductor &
Strage Company, Toshiba Corp.

----- 10:35~10:55 Authors corner & break -----

Process Evaluation Techniques & Metrology
and Inspection II

Chairman Yuichiro Yamazaki

(4) Study of energy discrimination effect of secondary electrons by SEM image prediction method.
T. Yokosuka(a), C. Lee(a), M. Hasegawa(a),
K. Kurosawa(b), and H. Kazumi(b) / a)Research &
Development Group, Center for Technology Innovation -
Controls, Hitachi, Ltd., b)Process Control Systems
Research and Development Dept., Hitachi
High-Technologies Corp.

Wednesday, Nov. 11, p.m.

Invited Talk

Chairman Koji Nakamae

(11) Large-scale cell production by using pluripotent stem cells (ES/IPS cells): Quality control of cell culture system and cell products
N. Nakatsuji / Professor Emeritus, Kyoto Univ.,
Institute for Integrated Cell-Material Sciences and Institute for Frontier Medical Sciences, Vice President, NPO Kyoto SMI, Director, Chief Adviser, Kyoto Stem Cell Innovation, Inc., and Stem Cell & Device Laboratory, Inc.

----- 14:50~15:10 Break & discuss with invited speaker ----

Power Device Analysis I

Chairman Yasunori Goto

(7) Direct imaging of local electromagnetic field
T. Ishiki / Electrical Engineering and Electronics, Kyoto
Institute of Technology

(8) Inspection of defects in 4H-SiC wafer by
T. Ishiki / Electrical Engineering and Electronics, Kyoto
Institute of Technology

15 Accommodation Information

There is Senri Hankyu Hotel around the symposium site. The hotel is located close to the symposium site and the Evening Session will be held in the hotel. 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-hkt.co.jp/
Comprehensive 2D-carrier profiling of low-doping region by high-sensitivity scanning spreading resistance microscopy (SSRM) for power devices
L. Zhang(a), M. Koike(a), M. Ono(a), S. Tait(a), K. Matsuzawa(a), S. Ono(b), W. Hatano(b), M. Yamaguchi(b), Y. Hayase(b), and K. Hara(b) (Advanced LSI Technology Lab., R&D Center, Toshiba, S&S Company, Toshiba)

Thursday, Nov. 12, a.m.
Electron Optics & Applications a.m., Thu 12

Development of electron optical device for correction of spherical aberration in high-resolution scanning / transmission electron microscopes
T. Kasawaki(a), T. Ishida(b), Y. Takai(c), Y. Ogawa(c), M. Tomita(c), M. Matsutani(c), T. Kodama(c), and T. Ikeda(c) (Advance LSI Structures Research Lab., Japan Fine Ceramics Center (JFCC), Institute of Materials and Systems for Sustainability, Nagoya Univ., Grad. Sch. Science and Technology, Meijo University, Vacuum Device Ltd., Faculty of Science and Engineering, Kinki Univ., Faculty of Engineering, Osaka Electro-Communication Univ.

Study on state analysis of Ti using DualEELS
N. Nakanishi(a), T. Kawai(b), and T. Ito(a) (Analysis Inspection and Metrology Engineering Dept., Toshiba, Advanced LSI Technology Lab., Toshiba)

Quantitative measurement of buried interface roughness by electron tomography and the future prospects
M. Hayashida(a), S. Ogawa(b), and M. Malac(a) (National Institute for Nanotechnology, Nanoelectronics Research Institute, National Institute of Advanced Industrial Science and Technology, Dept. Physics, Univ. Osaka)

Commercial Session a.m., Thu 12

High resolution X-ray CT system FF20 CT introduction of scan example
N. Seimiya(a) and R. Sommar(b) (Sales, YXLON International K. K., FEINFOCUS Product Line, YXLON International GmbH

Combination of ELITE analysis and nanofocus x-rays CT system
T. Ueno(a) and N. Nanbu(b) (SYSTEMS SALES & MARKETING Div., SALES Dept. 2, MARUBUN Corp., DEVICE SALES & MARKETING Div. 3, SALES Dept. 2, MARUBUN Corp.

Introduction of new plastic package IC opener “PS105”
S. Suzuki / Sales, Nippon Scientific Co., Ltd.

Introduction of low frequency lock-in OBIRCH analysis as a solution for the low resistance short failure analysis.

Introduction of image navigation system
K. Konishi / Product planning and development Gr, Astron. Inc.
(C14) Chip-level analysis using a cross-sectional SEM and an optical microscope
K. Nakano(a), J. Nakakobaru(b), K. Takahashi(b), and T. Kuba(a) / (a)System in Frontier Inc., (b)JEOL Ltd.

(C15) (Canceled)
Introduction of the kokyubinji-lab
M. Kato / TechanaLye Co., Ltd.

Poster Short Presentation
a.m., Thu 12
11:59~12:13 Poster Short Presentation
12:13~12:30 Group Photo
12:30~12:50 Break

(Hamamatsu Photonics Luncheon Seminar, “Recent topics on Hamamatsu Photonics,” *pre-registration required)

Thursday, Nov. 12, p.m.

Invited Talk
p.m., Thu 12
Chairman Koji Nakamae

(12) Innovation for future data-driven society
K. Sano / Director, Information Economy Div., Commerce and Information Policy Bureau, Ministry of Economy, Trade and Industry
13:50 (tentative)

(21) Measurement of cross section of p-i-n junction in amorphous silicon solar cell using super-higher-order scanning nonlinear dielectric microscopy
K. Hirose, N. Chino, and Y. Cho / Research Institute of Electrical Communication, Tohoku Univ.

(22) Visualization of current densities in field effect transistor devices using a tunnel magnetoresistive sensor
K. Suzuki(a), M. Tsutsumi(b), and Y. Terui(c) / (a)Grad. Sch. Engineering, Oita Univ., (b)Semiconductor & Storage Products Company, Toshiba, (c)JEOL Ltd.

(23) Three-dimensional reconstruction from a TEM tilt-series movie using support vector regression
Y. Midoh(a), Y. Mitsuya(a), R. Nishi(b), and K. Nakamae(a) / (a)Grad. Sch. Information Science and Technology, Osaka Univ., (b)Research Center for Ultra-High Voltage Electron Microscopy, Osaka Univ.

(32) Characterization of molecularly homogeneous inorganic transparent protective coating prepared by sol-gel process
H.S. Chen / National Tsing Hua Univ.

(14) Chip-level analysis using a cross-sectional SEM and an optical microscope
K. Nakano(a), J. Nakakobaru(b), K. Takahashi(b), and T. Kuba(a) / (a)System in Frontier Inc., (b)JEOL Ltd.

(18) DPA (destructive physical analysis) technique for SiC device
A. Hasegawa(a), H. Kubota(a), N. Nakamura(a), H. Tateyama(a), N. Otani(a), and T. Maezumi(b)

(19) Localization technique of short location in MIM capacitor
K. Ootai(a), M. Kurihara(b), T. Hashimoto(c), K. Norimatsu(c), H. Shiigi(c), and K. Haru(c) / (a)LSI Solutions Div., Toshiba Information Systems Corp., (b)Toshiba Micro Electronics Corp., (c)Toshiba Semiconductor & Storage Products Company

(20) Investigation on the power device analysis using a charged particle beam probing
K. Dai(a), M. Jinghong(c), K. Suzuki(c), Y. Soida(a), S. Murakami(a), K. Norimatsu(c), and M. Yoji(c) / (a)Grad. Sch. Engineering, Oita Univ., (b)Semiconductor & Storage Products Company, Toshiba, (c)JEOL Ltd.

(24) Study of multi-class image segmentation from three-dimensional electron microscope biological cell images

(25) A quantum watermarking scheme using simple and small-scale quantum circuits
S. Miyake and K. Nakamae / Grad. Sch. Information Science and Technology, Osaka Univ.

(26) Effective detection rate based on net length distribution for MCU
K. Shiozawa(a) and H. Ito(b) / (a)Technology Div., Analysis & Evaluation Technology Dept., Renesas Semiconductor Manufacturing Co., Ltd., (b)1st Solution Business Unit, Core Technology Business Div., Renesas Electronics Co., Ltd.

(27) Application of ultimate-BOST method for failure detection system using expected value generation from hardware units
K. Shiozawa(a), M. Kimura(b), K. Fukushima(c), K. Saito(d) and Y. Otani(d) / (a)Technology Div., Analysis & Evaluation Technology Dept., Renesas Semiconductor Manufacturing Co., Ltd., (b)Quality Assurance Div., 1st MCU Quality Assurance Dept., Renesas Electronics Co., Ltd., (c)Business Planning Div., Quality Control Dept., Renesas Design Co., Ltd., (d)Third Development Div., Syswave Corp.

(28) A 3D NoC routing algorithm supressing NBTI degradation

(29) Attack resistant design of scan-based AES encryption circuit against attacks using a physical analysis tool

(30) The study on current path formation using charged particle beams

(31) A study of MOSFET control with FIB in EBAC analysis
K. Suzuki(a), M. Hanada(a), J. Ma(a), D. Kitano(a), K. Norimatsu(b), and Y. Mashiko(a) / (a)Grad. Sch. Engineering, Oita Univ., (b)Semiconductor & Storage Products Company, Toshiba Corp.

(16) A learning based super-resolution for a single SEM image using continuous wavelet transform and markov random field
N. Okamoto, Y. Midoh, and K. Nakamae / Grad. Sch. Information Science and Technology, Osaka Univ.

(17) Technology trend for plastic package IC opener
S. Suzuki / Sales, Nippon Scientific Co., Ltd.
Fault Localization I  p.m., Thu 12
Chairman Ichiro Yoshii

(33) Frequency domain failure analysis for random logic circuit using a short cycle test pattern
J. Nonaka\(^a\), K. Shigeta\(^a\), N. Matsui\(^b\), A. Uchikado\(^b\) and S. Wada\(^b\) / \(^a\)Technology Div., Analysis and Evaluation Technology Dept., Renesas Semiconductor Manufacturing, \(^b\)Evaluation Analysis Div., Renesas Engineering Services
(34) Development of layout-based test coverage verification "physical test coverage"
Y. Nagamura\(^a\), T. Koyama\(^a\), J. Matsushima\(^b\), K. Tomonaga\(^d\), Y. Hoshi\(^c\), S. Nomura\(^c\), K. Iwasaki\(^d\) and M. Arai\(^c\) / \(^a\)Analysis & Evaluation Technology Dept., Renesas Semiconductor Manufacturing Co., Ltd., \(^b\)Design Integration Dept., Renesas System Design Co., Ltd., \(^c\)Evaluation Analysis Dept., Renesas Engineering Services Co., Ltd., \(^d\)Libray and Academic Information Center, Tokyo Metropolitan Univ., \(^e\)College of Industrial Technology, Nihon Univ.

Special Invited Talk  p.m., Thu 12
Chairman Hiroshi Terada

(51) True nanoscale resolution of IC debug & diagnosis - challenge to signal sensitivity and device preparation
C. Boit\(^a\), H. Lohrke\(^a\), P. Scholz\(^a\), A. Beyreuther\(^a\), U. Kerst\(^a\), and Y. Iwaki\(^b\) / \(^a\)Technische Universitt Berlin, Germany, \(^b\)Hamamatsu Photonics GmbH, Germany

Evening Session  p.m., Thu 12
18:50 Location:

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Fault Localization II  a.m., Fri 13
Chairman Toru Koyama

(35) Localization of inner-layer short failure of printed wiring board using lock-in thermography and its root cause analysis
H. Tsuchiya\(^a\), Y. Ikimoto\(^a\), K. Takamori\(^c\), K. Yamamoto\(^c\), I. Yoshii\(^d\), A. Bandi\(^d\), and Y. Iihara\(^f\) / \(^a\)Quality Assurance Dept. 1, Anden Co., Ltd., \(^c\)Reliability Test Center, Quality Co., Ltd., \(^d\)Reliability Analysis Div., Oki Engineering Co., Ltd., \(^f\)DCG Systems G. K., \(^e\)Scientific & Semiconductor Instruments R&D Dept., HORIBA Ltd., \(^f\)Kusumoto Chemicals Ltd. (ETAC Division

Fault Localization III  a.m., Fri 13
Chairman Yoji Mashiko

(36) Application to a semiconductor device of high precision temperature measurement technique

(37) Detailed thermal analysis of semiconductor devices with optical probed thermoreflectance image mapping (OPTIM)
K. Endo\(^b\), N. Kenji\(^b\), S. Takashi\(^a\), T. Nakamura\(^b\), T. Matsumoto\(^b\), K. Koshikawa\(^b\), and K. Nakamae\(^c\) / \(^b\)Semiconductor & Storage Products Company, Toshiba, \(^c\)System Div., Hamamatsu Photonics, \(^e\)Grad. Sch. Information Science and Technology, Osaka Univ.

(38) Extended sensitivity NIR camera for photon emission microscopy of ICs
A.B. Shehata\(^a\), F. Stellati\(^a\), A. Weger\(^a\), P. Song\(^a\), I. Yoshii\(^b\), H. Deslandes\(^b\), T. Lundquist\(^b\), and E. Ramsay\(^b\) / \(^a\)T. J. Watson Research Center, IBM, \(^b\)DCG Systems

(39) Magnetic current imaging and photon emission for die level electrical fault isolation
J. Gaudestal\(^a\), T. Dean\(^a\), and F. Rusli\(^a\) / \(^a\)Magma, Neocera, \(^b\)MicroChip Technology

Fault Localization II  a.m., Fri 13
Chairman Toru Koyama

(35) Localization of inner-layer short failure of printed wiring board using lock-in thermography and its root cause analysis
H. Tsuchiya\(^a\), Y. Ikimoto\(^a\), K. Takamori\(^c\), K. Yamamoto\(^c\), I. Yoshii\(^d\), A. Bandi\(^d\), and Y. Iihara\(^f\) / \(^a\)Quality Assurance Dept. 1, Anden Co., Ltd., \(^c\)Reliability Test Center, Quality Co., Ltd., \(^d\)Reliability Analysis Div., Oki Engineering Co., Ltd., \(^f\)DCG Systems G. K., \(^e\)Scientific & Semiconductor Instruments R&D Dept., HORIBA Ltd., \(^f\)Kusumoto Chemicals Ltd. (ETAC Division

(36) Application to a semiconductor device of high precision temperature measurement technique

(37) Detailed thermal analysis of semiconductor devices with optical probed thermoreflectance image mapping (OPTIM)
K. Endo\(^b\), N. Kenji\(^b\), S. Takashi\(^a\), T. Nakamura\(^b\), T. Matsumoto\(^b\), K. Koshikawa\(^b\), and K. Nakamae\(^c\) / \(^b\)Semiconductor & Storage Products Company, Toshiba, \(^c\)System Div., Hamamatsu Photonics, \(^e\)Grad. Sch. Information Science and Technology, Osaka Univ.

(38) Extended sensitivity NIR camera for photon emission microscopy of ICs
A.B. Shehata\(^a\), F. Stellati\(^a\), A. Weger\(^a\), P. Song\(^a\), I. Yoshii\(^b\), H. Deslandes\(^b\), T. Lundquist\(^b\), and E. Ramsay\(^b\) / \(^a\)T. J. Watson Research Center, IBM, \(^b\)DCG Systems

(39) Magnetic current imaging and photon emission for die level electrical fault isolation
J. Gaudestal\(^a\), T. Dean\(^a\), and F. Rusli\(^a\) / \(^a\)Magma, Neocera, \(^b\)MicroChip Technology
Panel Session  p.m., Fri 13

16:05  Theme: Dopant Visualization
Panelist:
Kyoichiro Asayama / JEOL
Yuasu Shimizu / Tohoku Univ.
Yasu Cho / Tohoku Univ.
Li Zhang / Toshiba
Takaya Fujita / Nissan Arc

(P1) Dopant visualization - introduction to panel discussion -
K. Nikawa / Grad. Sch. Engineering, Kanazawa Institute of Technology

(P2) Detection of dopant in the semiconductor devices by using electron microscope
K. Asayama(1) and K. Asayama(2) / EM business unit, JEOL Ltd., (2)Research Center For Ultra-High Voltage Electron Microscopy, Osaka Univ.

(P3) Three-dimensional atom probe for dopant distribution analysis in semiconductor devices
Y. Shimizu / Institute for Materials Research, Tohoku Univ.

(P4) Scanning nonlinear dielectric microscopy
Y. Cho / Research Institute of Electrical Communication, Tohoku Univ.

(P5) 1nm 高分解能走査型抵抗顕微鏡 (SSRM) を用いた si デバイスにおける 2 次元キャリア分布計測
L. Zhang / Advanced LSI Technology Lab., Corporate R&D Center, Toshiba Corp.

(P6) Measurement uncertainty and quantification for measuring carrier concentration in semiconductor devices by using scanning capacitance microscopy
T. Fujita / Power Electronics Analysis Lab., NISSAN ARC, Ltd.

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- Simple numbers and numbers preceded by 'C' show presentation numbers in the technical and the commercial sessions, respectively.

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Boit, T. . . . . . S1
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21 Exhibition

Thursday, Nov. 12 and Friday, Nov. 13, 10:00~17:00
In Senri Room, the 6th floor

- Numbers preceded by 'C' after company names show presentation numbers in the Commercial Session.

1. HisSol, inc.: Package unsealing, thermal analysis, and wafer cleavage / laser cutter / wire bonding, pick-up, and assembly tool
2. Nippon Barnes Co., Ltd.: Projection-Moiear Waveport and Deformation measurement system — TDM
3. YXLON international K.K.; C1 New product. High resolution X-ray CT FF20 CT
4. AD Science Inc.: Nano-Prober, Plasma Asher, Sputter/Carbon Coater, Cryo-SEM Preparation System
5. FEI Company Japan Ltd.: FIB, SEM and TEM Systems for Device Analysis and Circuit Edit

The exhibition floorplan is subject to change without notice.
6. Oxford Instruments KK: C10
Scanning Microwave Impedance Microscopy (sMIM),
X-Max Extreme Windowless Silicon Drift Detector for SEM

7. Hitachi High-Technologies Corporation:
Electron Beam Absorbed Current (EBAC)
Characterization System nanoEBAC NE4000

8. AITRANS Corporation:
Kaiseki-support lab, Table-top plasma etching instrument
TP-50B

Decapsulation system by laser, RIE, chemical

10. Hamamatsu Photonics K.K.: C4
Semiconductor failure analysis systems

11. TOKI COMMERCIAL CO., LTD:
High-voltage prober

12. Renesas Engineering Services Co., Ltd:
Introduction of fault location analysis

13. Astron, Inc: C5
Image Navigation system AZView

14. DCG Systems G.K.: C6
Innovative solutions to maximize the yield and efficiency of micro-fabrication technologies

15. Oki Engineering Co., Ltd.: C7
The 35th Annual NENO Testing Symposium

16. MARUBUN Corporation: C8
Combination of ELITE analysis and nanofocus x-rays CT system

17. JEOL Ltd.: C12.C14
Multi-point automatic analysis using an electron microscope

18. TOOL Corporation: C6
Latest version of LAVIS-plus

19. BN TECHNOLOGY CORPORATION: C8
Small-sized Precision Polishing System Bni20 series

20. Toyo Corporation: C13
New FE-SEM “GeminiSEM series” which combine Low-kV, Low Vacuum and High resolution

21. aBeam Technologies Japan, Inc.:
Softwares for physical analysis and metrology using e-beam technologies

22. ADVANTEST Corporation:
Integrated circuit failure analysis system
TS9000-TDR/TDT

23. Wafer Integration Inc. and YOKOWO Co., LTD: C7
DdProber Self-sensing AFM Nanoprober WI3000

24. SHINING TECHNOLOGY CORPORATION LIMITED:
Dacapsulation Product

25. APOLLLOWAVE Corporation:
Manual Probe Station

26. Park Systems Japan Inc.:
New high vacuum AFM for electrical characteristics & failure analysis, NX-HiVac

22 List of Associate Members
(in alphabetic order, 1 November 2015)

- aBeam Technologies, Inc.
- AD Science Co.
- ADVANTEST CORPORATION
- AITRANS corporation
- APOLLLOWAVE Corporation
- Applied Materials, Inc.
- ASTRON Inc.
- ATE Service Corp.
- BN TECHNOLOGY CORPORATION
- DCG SYSTEMS G.K.
- FEI Company Japan Ltd.
- Hamamatsu Photonics K.K.
- HiSOL, INC.
- Hitachi High-Tech Science Corporation
- Hitachi High-Technologies Corporation
- JEOL Ltd.
- MARUBUN CORPORATION
- MultiProbe Inc.
- NGR Inc.
- Nippon BARNES Company, Ltd.
- Nippon Scientific Co., Ltd
- Oki Engineering Co., Ltd.
- Oxford Instruments K.K.
- Park Systems Japan Inc.
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