## Prof. Ohmi's Paper

## January – December, 1993

- Tadahiro Ohmi, K. Matsumoto, K. Nakamura, K. Makihara, Jun Takano, and K. Yamamoto, "Influence of Silicon Wafer Surface Orientation on Very Thin Oxide Quality," <u>Applied Physics Letters</u>, Vol. 62, No. 4, pp. 405-407, January 1993.
- 339(F) Koji Makihara, Akinobu Teramoto, Kou Nakamura, Myoung Youn Kwon, Mizuho Morita, and Tadahiro Ohmi, "Preoxide-Controlled Oxidation for Very Thin Oxide Films," <u>Jpn. J. Appl. Phys.</u>, Vol. 32, No. 1B, pp. 294-297, January 1993.
- 340(F) Hisayuki Shimada, Shigeki Shimomura, Kouichi Hirose, and Tadahiro Ohmi, "High-Sensitivity and High-Resolution Contact Hole Pattering by Enhanced-Wettability Developer," <u>Jpn. J. Appl. Phys.</u>, Vol. 32, No. 1B, pp. 347-351, January 1993.
- Takeo Yamashita, Tadashi Shibata, and Tadahiro Ohmi, "Neuron MOS Winner-Take-All Circuit and its Application to Associate Memory," 1993 IEEE International Solid-State Circuits Conference, Digest of Technical Papers, San Francisco, pp. 236-237, February 1993.
- Tadashi Shibata, Koji Kotani, and Tadahiro Ohmi, "Real-Time Reconfigurable Logic Circuits Using Neuron MOS Transistors," <u>Digest of Technical Papers</u>, 1993 IEEE International Solid-State Circuits Conference, San Francisco, pp. 238-239, February 1993.
- 343(F) Haruhiro Harry Goto, Hans-Dirk Lowe, and Tadahiro Ohmi, "Independent Control of Ion Density and Ion Bombardment Energy in a Dual RF Excitation Plasma," <u>IEEE Trans. on Semiconductor Manufacturing</u>, Vol. 6, No. 1, pp. 58-64, February 1993.
- 344(F) Keiichi Yamada, Mizuho Morita, Choon Min Soh, Hiroshi Suzuki, and Tadahiro Ohmi, "Low-temperature Silicon Epitaxy Using Gas Molecular-Flow Preshowering," <u>Journal of the Electrochemical Society</u>, Vol. 140, No. 2, pp. 371-377, February 1993.
- 345(C) T. Takewaki, T. Hoshi, T. Shibata, T. Ohmi, and T.Nitta, "Giant-Grain-Copper Thin Films Formed by Low-Kinetic-Energy Particle Process and Their Electrical Properties," Abstracts, <u>The First International Symposium on Metallic Multilayers (MML'93)</u>, Kyoto, pp. 184, March 1993.
- Tadahiro Ohmi, "Advanced Wet Chemical Processing Based on Closed Manufacturing System," Chemical Proceeding, <u>1993 Semiconductor Pure Water and Chemicals Conference</u>, Santa Clara, pp. 1-26, March 1993.
- 347(C) Ichiro Kawanabe, G. Murase, T. Yonezawa, M. Maeno, Nobuhiro Miki, and Tadahiro Ohmi, "Direct Evaluation-Inner ICP-MS for Ultrapure Chemicals," Chemical Proceeding, 1993 Semiconductor Pure Water and Chemicals Conference, Santa Clara, pp. 27-44, March 1993.

- 348(C) Hiroyuki Mishima and Tadahiro Ohmi, "Resistivity Variation of Isopropyl Alcohol Due to the Kind of Electrolyte," Chemical Proceeding, 1993

  Semiconductor Pure Water and Chemicals Conference, Santa Clara, pp. 159-183, March 1993.
- 349(C) Seiji Sudoh, Tadahiro Ohmi, and Hiroyuki Mishima, "Static Charge Removal with IPA Solution," Chemical Proceeding, 1993 Semiconductor Pure Water and Chemicals Conference, Santa Clara, pp. 184-203, March 1993.
- K. Kimura, Y. Ogata, F. Tanaka, Jun Takano, Tatsuhiko Isagawa, Masahiko Kogure, Takashi Futatsuki, and Tadahiro Ohmi, "Study on an Influence of TOC in Hydrogen Peroxide for Advanced Wet Chemical Processing," Chemical Proceeding, 1993 Semiconductor Pure Water and Chemicals Conference, Santa Clara, pp. 204-219, March 1993.
- 351(C) Katsuhide Ohtani, Kiyohiko Ihara, and Tadahiro Ohmi, "Adhesion and Removal of Metallic Impurities on PFA Surface," Chemical Proceeding, 1993

  Semiconductor Pure Water and Chemicals Conference, Santa Clara, pp. 220-236, March 1993.
- Tatsuhiko Isagawa, Masahiko Kogure, Takashi Futatsuki, and Tadahiro Ohmi, "Organic Adsorption onto Si Wafer Surface and Their Removal Using Ozonized Ultrapure Water for Semiconductor Manufacturing," Water Proceeding, 1993 Semiconductor Pure Water and Chemicals Conference, Santa Clara, pp. 117-139, March 1993.
- Tadashi Shibata and Tadahiro Ohmi, "Neuron MOS Binary-Logic Integrated Circuits -Part I: Design Fundamentals and Soft-Hardware-Logic Circuit Implementation," <u>IEEE Trans. on Electron Devices</u>, Vol. 40, No. 3, pp. 570-576, March 1993.
- Tadahiro Ohmi, Tatsuhiko Isagawa, Masahiko Kogure, and Takashi Imaoka, "Native Oxide Growth and Organic Impurity Removal on Si Surface with Ozone-Injected Ultrapure Water," <u>Journal of Electrochemical Society</u>, Vol. 140, No. 3, pp.804-810, March 1993.
- Tadahiro Ohmi, Takashi Imaoka, Takehiko Kezuka, Jun Takano, and Masahiko Kogure, "Segregation and Removal of Metallic Impurity at Interface of Silicon and Fluorine Etchant," <u>Journal of Electrochemical Society</u>, Vol. 140, No. 3, pp. 811-818, March 1993.
- Shigeki Shimomura, Hisayuki Shimada, Rita Au, Mamoru Miyawaki, and Tadahiro Ohmi, "High-Resolution Pattern Formation Featuring Excellent Dimension Correlation by Enhanced-Wettability Development Technology," Technical Program and Abstracts, <u>SPIE's 1993 Symposium on Microlithography</u>, San Jose, pp. 125, March 1993.
- 356-2(C) Shigeki Shimomura, Hisayuki Shimada, Rita Au, Mamoru Miyawaki, and Tadahiro Ohmi, "High-Resolution Pattern Formation Featuring Excellent Dimension Correlation," Proceedings, <u>Advances in Resist Technology and Processing X</u>, San Jose, pp. 602-613, March 1993.
- Tadashi Shibata and Tadahiro Ohmi, "Neuron MOS Voltage-Mode Circuit Technology for Multiple-Valued Logic," <u>IEICE Trans on Electron</u>, Vol. E76-C, No. 3, pp. 347-356, March 1993.

- Yasuo Aoki, Shintaro Aoyama, Hiroaki Uetake, Kohei Morizuka, and Tadahiro Ohmi, "In Situ Substrate Surface Cleaning by Low-Energy Ion Bombardment for High Quality Thin Film Formation," <u>Journal Vacuum Science Technology</u> A, Vol. 11, No. 2, pp. 307-313, March/April 1993.
- Takahisa Nitta, Tadahiro Ohmi, Tsukasa Hoshi, Satoshi Sakai, Kunihiko Sakaibara, Shigeru Imai, and Tadashi Shibata, "Evaluating the Large Electromigration Resistance of Copper Interconnects Employing a Newly Developed Accelerated Life- Test Method," <u>Journal of Electrochemical Society</u>, Vol. 140, No. 4, pp. 1131-1137, April 1993.
- 360(F) Koji Kotani, Tadahiro Ohmi, Satoshi Shimonishi, Tomohiro Migita, Hideki Komori, and Tadashi Shibata, "Self-Aligned Aluminum-Gate MOSFET's Having Ultra-Shallow Junctions Formed by 450 C Furnance Annealing," IEICE Trans. on Electron, Vol. E76-C, No. 4, pp. 541-547, April 1993.
- Takeo Yamashita and Tadahiro Ohmi, "Minimizing the Edge Effect in a DRAM Cell Capacitor by Using a Structure with High-Permittivity Thin Film," <u>IEICE Trans. on Electron</u>, Vol. E76-C, No. 4, pp. 556-561, April 1993.
- Takahisa Nitta, Tadahiro Ohmi, Tsukasa Hoshi, Toshiyuki Takewaki, and Tadashi Shibata, "Characterizing Film Quality and Electromigration Resistance of Giant-Grain Copper Interconnects," <u>IEICE Trans. on Electron</u>, Vol. E76-C, No. 4, pp. 626-634, April 1993.
- Tadashi Shibata and Tadahiro Ohmi, "Neuron MOS Binary-Logic Integrated Circuits -PartII: Simplifying Techniques of Circuit Configuration and their Practical Applications," <u>IEEE Trans. on Electron Devices</u>, Vol. 40, No. 5, pp. 974-979, May 1993.
- 364(C) Kazuo Tsukazaki, Seiji Aotani, and Tadahiro Ohmi, "Non-Restrictive Evaluation Method for All Metal In-Line Gas Filters Using Microsol," 1993

  Proceedings, 39th Annual Technical Meeting, Institute of Environmental Sciences, Vol. 1, Las Vegas, pp. 149-157, May 1993.
- 365(C) Fumitomo Kunimoto, Tadahiro Ohmi, and Frederick W. Kern, Jr., "Rapid Surface Cleaning by Spin Cleaning Technique," 1993 Proceedings, 39th Annual Technical Meeting, Institute of Environmental Sciences, Vol. 1, Las Vegas, pp. 245-254, May 1993.
- Tadahiro Ohmi, "Tohoku University Research on Wafer Surface Cleaning,"

  1993 Proceedings, 39th Annual Technical Meeting, Institute of Environmental

  Sciences, Vol. 1, Las Vegas, pp. 255-267, May 1993.
- Takashi Futatsuki, Hitoshi Morinaga, Tadahiro Ohmi, Eiji Fuchita, Masaaki Oda, and Chikara Hayashi, "Mechanism of Particle Contamination Removal from Si Wafers," 1993 Proceedings, 39th Annual Technical Meeting, Institute of Environmental Sciences, Vol. 1, Las Vegas, pp. 282-287, May 1993.
- Masahiko Kogure, Tatsuhiko Isagawa, Takashi Futatsuki, Naomichi Yonekawa, and Tadahiro Ohmi, "Ozonized Ultrapure Water Treatment of Organic Contamination on Si-Wafer Surface," 1993 Proceedings, 39th Annual Technical Meeting, Institute of Environmental Sciences, Vol. 1, Las Vegas, pp. 380-385, May 1993.

- Francois Derouin, Hideki Aomi, and Tadahiro Ohmi, "Mechanism of Metallic Contamination on Si Wafers," 1993 Proceedings, 39th Annual Technical Meeting, Institute of Environmental Sciences, Vol. 1, Las Vegas, pp. 460-465, May 1993.
- E370(C) Masayuki Toda, Masahiko Shishido, Yoh-ichi Kanno, Masaru Umeda Takahisa Nitta, Yoshio Saito and Tadahiro Ohmi, "Wafer Transportation Technology for Closed Manufacturing Process-Transportation on a Lubricating Gas Film-," 1993 Proceedings, 39th Annual Technical Meeting, Institute of Environmental Sciences, Vol. 1, Las Vegas, pp.478-482, May 1993.
- E371(C) Terutaka Sahara, Masahiko Kogure, Tadahiro Ohmi, Yutaka Hiratuka and Yasuo Kamimura, "N<sub>2</sub> Sealed Wet Station for Advanced Native Oxide Free Processing," 1993 Proceedings, 39th Annual Technical Meeting, Institute of Environmental Sciences, Vol. 1, Las Vegas, pp. 483-487, May 1993.
- E372(C) Kazuma Yamamoto, Koji Makihara and Tadahiro Ohmi, "Portable Wafer Transportation System with Ultraclean N<sub>2</sub> Gas Continuous Purge Function," 1993 Proceedings, 39th Annual Technical Meeting, Institute of Environmental Sciences, Vol. 1, Las Vegas, pp. 500-505, May 1993.
- E373-1(C) Takashi Matuura, Junichi Murota, Tadahiro Ohmi and Shoichi Ono, "Comparison of Polysilicon Etching between Pure and Nitrogen Added Chlorine ECR Plasmas," Extended Abstracts, <u>183th Electrochemical Society Meeting</u>, Honolulu, Abstract No. 246, pp. 358-359, May 1993.
- E373-2 (P) Takashi Matuura, Junichi Murota, Tadahiro Ohmi and Shoichi Ono, "Comparison of Polysilicon Etching between Pure and Nitrogen Added Chlorine ECR Plasmas," Edited by G. S. Mathad and Y. Horiike, <u>Highly Selective Dry Etching and Damage Control</u>, PV93-21, pp. 141-148, The Electrochemical Society, Pennington, NJ 1993.
- E374-1(C) Yuji Maeda, Hiroshi Suzuki, T. Sakoh, K. Morita, Mizuho Morita and Tadahiro Ohmi, "Selective Tungsten Deposition Using Cold Susceptor," Extended Abstracts, <u>183th Electrochemical Society Meeting</u>, Honolulu, Abstract No. 303, pp. 461-462, May 1993.
- Y. Maeda, H. Suzuki, T. Sakoh, K. Morita, M. Morita and Tadahiro Ohmi, "Selective Tungsten Deposition Using Cold Susceptor," Edited by T.O.Herndon, K.Okabayashi and N.Alvi, <u>Interconnects, Contact Metallization, and Multilevel Metallization</u> & Edited by H. S. Rathore, R. A. Susko and M. Kashiwagi, <u>Reliability Semiconductor Devices, Interconnects, and Thin Insulator Materials</u>, PV93-25, pp. 179-189, The Electrochemical Society, Pennington, NJ 1993.
- E375-1(C) Keiichi Yamada, H.Yamada, Nobuhiro Konishi, Yasuaki Kawai and Tadahiro Ohmi, "Metal-to-Silicon Contact Formation for Highly Reliable ULSI by Low-Energy Ion Bombardment Process," Extended Abstracts, <u>183th Electrochemical Society Meeting</u>, Honolulu, Abstract No. 310, pp. 473-474, May 1993.

- E375-2 (P) K. Yamada, H. Yamada, N. Konishi, Y. Kawai and Tadahiro Ohmi, "Metal-To-Silicon Contact Formation for Highly Reliable ULSI by Low-Energy Ion Bombardment Process," Edited by T. O. Herndon, K. Okabayashi and N. Alvi, Interconnects, Contact Metallization, and Multilevel Metallization & Edited by H. S. Rathore, R. A. Susko and M. Kashiwagi, Reliability Semiconductor Devices, Interconnects, and Thin Insulator Materials, PV93-25, pp. 256-267, The Electrochemical Society, Pennington, NJ 1993.
- E376-1(C) Tadahiro Ohmi, Koichi Matsumoto, Koji Makihara, K. Nakamura, Kazuma Yamamoto and Jun Takano, "Effect of Silicon Surface Orientation on Very Thin Oxide Reliability," Extended Abstracts, <u>183th Electrochemical Society Meeting</u>, Honolulu, Abstract No. 382, pp. 573-574, May 1993.
- E376-2 (P) Tadahiro Ohmi, K. Matsumoto, K. Nakamura, K. Makihara, K. Yamamoto and J. Takano, "Effect of Silicon Surface Orientation on Very Thin Oxide Reliability," Edited by T. O. Herndon, K. Okabayashi and N. Alvi, Interconnects, Contact Metallization, and Multilevel Metallization & Edited by H. S. Rathore, R. A. Susko and M. Kashiwagi, Reliability Semiconductor Devices, Interconnects, and Thin Insulator Materials, PV93-25, pp. 362-371, The Electrochemical Society, Pennington, NJ 1993.
- E377-1(C) Mizuho Morita, K. Nakamura, A. Teramoto, Koji Makihara and Tadahiro Ohmi, "High Reliability of Ultraclean Oxide Films," Extended Abstracts, <u>183th</u> <u>Electrochemical Society Meeting</u>, Honolulu, Abstract No. 393, pp. 589-590, May 1993.
- E377-2 (P) M. Morita, K. Nakamura, A. Teramoto, K. Makihra and Tadahiro Ohmi, "High Reliability of Ultraclean Oxide Films," Edited by T. O. Herndon, K. Okabayashi and N. Alvi, <u>Interconnects, Contact Metallization, and Multilevel Metallization</u> & Edited by H. S. Rathore, R. A. Susko and M. Kashiwagi, <u>Reliability Semiconductor Devices, Interconnects, and Thin Insulator Materials</u>, PV93-25, pp. 451-460, The Electrochemical Society, Pennington, NJ 1993.
- E378-1(C) Yoshinori Nakagawa, Hideki Aomi, Jun Takano and Tadahiro Ohmi, "New Measurement Method of Adsorbed Moisture Concentration on Solid Surface," Extended Abstracts, 183th Electrochemical Society Meeting, Honolulu, Abstract No. 780, pp. 1131-1132, May 1993.
- E378-2 (P) Yoshinori Nakagawa, Hideki Aomi, Jun Takano and Tadahiro Ohmi, "New Measurement Method of Adsorbed Moisture Concentration on Solid Surface," Edited by R. Novak, T. Ito, D. N. Schmidt and D. Reedy, <u>Contamination Control and Defect Reduction in Semiconductor Manufacturing II</u>, PV94-3, pp. 97-108, The Electrochemical Society, Pennington, NJ 1994.
- E379(C) Hideki Aomi, Francois Derouin and Tadahiro Ohmi, "The Influence of Anion Species on the Cu Adhesion onto Si Wafer Surface," Extended Abstracts, <u>183th</u>
  <u>Electrochemical Society Meeting</u>, Honolulu, Abstract No. 788, pp. 1144-1145, May 1993.
- E380-1(C) Michel Morin, Shinji Miyoshi, Koji Kawada and Tadahiro Ohmi, "Ultraclean Welding for High Grade Gas Handling Technology," Extended Abstracts, 183th Electrochemical Society Meeting, Honolulu, Abstract No. 802, pp. 1167-1168, May 1993.

- E380-2(P) Michel Morin, Shinji Miyoshi, Koji Kawada and Tadahiro Ohmi, "Ultraclean Welding for High Grade Gas Handling Technology," Edited by R. Novak, T. Ito, D. N. Schmidt and D. Reedy, <u>Contamination Control and Defect Reduction in Semiconductor Manufacturing II</u>, PV94-3, pp. 295-305, The Electrochemical Society, Pennington, NJ 1994.
- E381(C) Tadahiro Ohmi, "Dual-Frequency-Excitation Plasma for Perfect Parameter Controlled Advanced Semiconductor Processing," Proceedings, <u>The Second International Symposium on Sputtering & Plasma Processes -ISSP'93-,</u>" Tokyo, pp. 123-126, May 1993.
- E382(C) Tadahiro Ohmi and Tadashi Shibata, "Advanced Scientific Semiconductor Processing Based on Precisely Controlled Low Energy Ion Bombardment," <a href="https://example.com/EMRS 1993">EMRS 1993 Spring Meeting</a>, Strasbourg, Abstract No. CD-III. 2, May 1993.
- E383 (F) J. Echigoya, T. Satoh and Tadahiro Ohmi, "Thin Film Reaction and Interface Structure of Cu on (111)Si," <u>Acta Metall. Mater</u>, Vol. 41, No. 1, pp. 229-234, 1993.
- E384 (F) Tadahiro Ohmi, "ULSI Reliability through Ultraclean Processing," <u>Proceeding of the IEEE</u>, Special Issue on VLSI Reliability, Vol. 81, No. 5, pp. 716-729, May 1993.
- E385 (F) Tadahiro Ohmi, Atsushi Ohki, Masakazu Nakamura, Koji Kawada, Tsuyoshi Watanabe, Yoshinori Nakagawa, Shinji Miyoshi, Shinji Takahashi and Michael S. K. Chen, "The Technology of Chromium Oxide Passivation on Stainless Steel Surface," <u>Journal of Electrochemical Society</u>, Vol. 140, No. 6, pp. 1691-1699, June 1993.
- E386(C) Tadashi Shibata and Tadahiro Ohmi, "Four-Terminal Device Impact of a New Functional Transistor on Logic Integrated Circuits Implementation," Proceedings, <u>International Workshop on Process and Devices of Scaled LSI's</u>, Seoul, pp. 1-6, June 1993.
- E387(C) Koji Makihara, Koh Nakamura, Koichi Matsumoto, Jun Takano, Kazuma Yamamoto and Tadahiro Ohmi, "High-Reliability Very-Thin Gate-Oxide Films Formed by Ultraclean Oxidation," Proceedings, <u>International Workshop on</u> Process and Devices of Scaled LSI's, Seoul, pp. 52-56, June 1993.
- E388(C) Francois Derouin, Hideki Aomi and Tadahiro Ohmi, "Anions Effects on Metallic Contamination on Silicon Wafers," Proceedings, <u>International Workshop on Process and Devices of Scaled LSI's</u>, Seoul, pp. 144-151, June 1993.
- E389(C) Masaki Hirayama, Wataru Shindo and Tadahiro Ohmi, "Low-Temperature Silicon Epitaxy by Precisely Controlled Plasma Processing," Proceedings, International Workshop on Process and Devices of Scaled LSI's, Seoul, pp. 152-157, June 1993.
- E390 (B) Tadahiro Ohmi, "Preface," <u>Ultraclean Technology Handbook Vol.1 Ultrapure Water</u>, Marcel Dekker, Inc., June 1993.
- E391 (B) Michiya Kawakami, Makoto Ohwada, Yasuyuki Yagi, and Tadahiro Ohmi, "Ultrapure Water Evaluation by the Water Spot Method", <u>Ultraclean Technology Handbook Vol.1 Ultrapure Water</u>, Chapter VII-11., pp.793-796, Marcel Dekker, Inc., June 1993.

- E392 (B) Michiya Kawakami, and Tadahiro Ohmi, "Outline," <u>Ultraclean Technology</u>
  <u>Handbook Vol.1 Ultrapure Water</u>, Chapter VII-2., pp.803-804, Marcel Dekker,
  Inc., June 1993.
- E393 (B) Michiya Kawakami, Yasuyuki Yagi, Tadahiro Ohmi, and Motohiro Okazaki, "Wet Etch Cleaning-Water Spot Growth Conditions," <u>Ultraclean Technology Handbook Vol.1 Ultrapure Water</u>, Chapter VIII-3.-D, pp.831-834, Marcel Dekker, Inc., June 1993.
- E394 (B) Michiya Kawakami, Makoto Ohwada, Yasuyuki Yagi, and Tadahiro Ohmi, "Suppression of Native Oxide," <u>Ultraclean Technology Handbook Vol.1</u> <u>Ultrapure Water</u>, Chapter WII-5, pp.857-868, Marcel Dekker, Inc., June 1993.
- E395 (B) Yasuyuki Yagi, Michiya Kawakami, Kenichi Sato, and Tadahiro Ohmi, "High-Temperature, High-Pressure, Ultrapure Water Spray-Cleaning," Ultraclean Technology Handbook Vol.1 Ultrapure Water, Chapter WI-7, pp.877-894, Marcel Dekker, Inc., June 1993.
- E396 (B) Tadahiro Ohmi, Ichiro Kawanabe, Masayuki Miyashita, and Fredrick W. Kern, Jr., "The Future of Wet Processing," <u>Ultraclean Technology Handbook Vol.1</u> Ultrapure Water, Chapter WII-8, pp.895-908, Marcel Dekker, Inc., June 1993.
- E397 (F) Katsuhide Ohtani, Tadahiro Ohmi and K. Ihara, "Study on Adhesion and Removal of Metallic Impurities on a Perfluoroalkoxy Resin Surface," <u>Journal of Electrochemical Society</u>, Vol. 140, No. 8, pp. 2244-2249, August 1993.
- E398 (F) Hisayuki Shimada, Masanobu Onodera, Toru Nonaka, Kouichi Hirose and Tadahiro Ohmi, "Advanced Development Process for Ultra Fine Photoresist Patterns," <u>IEEE Trans. on Semiconductor Manufacturing</u>, Vol. 6, No. 3, pp. 269-273, August 1993.
- E399 (F) Mitsushi Itano, Frederick W. Kern, Jr., Masayuki Miyashita and Tadahiro Ohmi, "Particle Removal from Silicon Wafer Surface in Wet Cleaning Process," <u>IEEE Trans on Semiconductor Manufacturing</u>, Vol. 6, No. 3, pp. 258-267, August 1993.
- E400(C) Takashi Matsuura, Junichi Murota, Yasuji Sawada and Tadahiro Ohmi, "Layer-by-Layer Etching of Si by Self-Limited Adsorption of Chlorine with Alternated Irradiation of Low Energy Ar<sup>+</sup> Ions," Extended Abstracts, 1993 International Conference on Solid State Devices and Materials, Chiba, pp. 83-85, August 1993.
- E401(C) Mizuho Morita and Tadahiro Ohmi, "Characterization and Control of Native Oxide on Silicon," Extended Abstracts, <u>1993 International Conference on Solid State Devices and Materials</u>, Chiba, pp. 95-97, August 1993.
- E402(C) K. Ohmi, K. Nakamura, T. Futatsuki, K. Makihara and T. Ohmi, "Influence of Si-SiO<sub>2</sub> Interface Microroughness and Dopant Concentration on Electron Channel Mobility in MOSFET," Extended Abstracts, <u>1993 International Conference on Solid State Devices and Materials</u>, Chiba, pp. 149-151, August 1993.
- E403(C) Masaki Hirayama, Wataru Shindo and Tadahiro Ohmi, "Impact of High-Precision RF-Plasma Control on Very-Low-Temperature Silicon Epitaxy," Extended Abstracts, 1993 International Conference on Solid State Devices and Materials, Chiba, pp. 210-212, August 1993.

- E404(C) H. Suzuki, Y. Maeda, K. Morita, M. Morita and T. Ohmi, "Selective Tungsten CVD with High Deposition Rate for ULSI Application," Extended Abstracts, <a href="1993">1993</a> International Conference on Solid State Devices and Materials, Chiba, pp. 540-542, August 1993.
- E405(C) T. Hoshi, H. Yamada, T. Takewaki, T. Shibata, T. Ohmi and T. Nitta, "Accelerated Electromigration Testing of Giant-Grain Copper Interconnects under Extremely Large Current Stress," Extended Abstracts, 1993 International Conference on Solid State Devices and Materials, Chiba, pp. 561-563, August 1993.
- E406(C) T. Iwamoto, H. Shimada, S. Shimomura, M. Onodera and T. Ohmi, "High-Reliability Lithography Performed by Ultrasonic and Surfactant-Added Developing System," Extended Abstracts, 1993 International Conference on Solid State Devices and Materials, Chiba, pp. 573-575, August 1993.
- E407(C) K. Nakamura, K. Ohmi, K. Yamamoto, K. Makihara and T. Ohmi, "Silicon Wafer Orientation Dependence of MOS Device Reliability," Extended Abstracts, 1993 International Conference on Solid State Devices and Materials, Chiba, pp. 585-587, August 1993.
- E408(C) K. Ino, I. Natori, A. Ichikawa and T. Ohmi, "In Situ Chamber Cleaning Using Halogenated-Gas Plasma Evaluated by Plasma-Parameter Extraction," Extended Abstracts, 1993 International Conference on Solid State Devices and Materials, Chiba, pp. 588-590, August 1993.
- E409(C) Hiroaki Uetake, Gang Su Jong and Tadahiro Ohmi, "Proposal for Equipment Standardization by Dual-Frequency-Excitation Plasma Processing," Extended Abstracts, 1993 International Conference on Solid State Devices, Chiba, pp. 591-593, August 1993.
- E410(C) T. Ohmi, T. Kezuka, M. Itano, M. Kubo, and M. Miyawasaki, "Particle Deposition Control for Various Wafer Surfaces in Acidic Solution with Surfactant," Proceedings of the Abstracts, 24th Annual Meeting of the Fine Particle Society, Chicago, pp. 63, August 1993.
- E411(C) Hitoshi Morinaga, Takashi Futatsuki and Tadahiro Ohmi, "Behaviour of Ultra Fine Particles on Silicon Substrates," Proceedings of the Abstracts, <u>24th Annual Meeting of the Fine Particle Society</u>, Chicago, pp. 108, August 1993.
- E412 (F) Tadahiro Ohmi, Yoshinori Nakagawa, Hideki Aomi and Jun Takano, "New Tequnique for the Measurement of Adsorbed Moisture Concentration on a Solid Surface," <u>Rev. Sci. Instrum.</u>, Vol. 64, No. 9, pp. 2683-2686, September 1993
- E413(C) Tadahiro Ohmi, "Ultraclean Technology for ULSI," <u>International Symposium on Semiconductor Manufacturing</u>, Austin, pp. 311-330, September 1993.
- E414(C) Yoshinori Nakagawa, Hiroto Izumi, Shinji Miyoshi, Tsutomu Kojima and Tadahiro Ohmi, "Measurement of Adsorbed Moisture Concentration on Solid Surface by Using Anhydrous Hydrogen Fluoride," Proceedings, Microcontamination 93, San Jose, pp. 586-595, September 1993.
- E415(C) Shinji Takahashi, Shinji Miyoshi, Tsutomu Kojima, Tomoyuki Koyama and Tadahiro Ohmi, "Corrosion-Resistant and Non- Catalytic Properties of Cr<sub>2</sub>O<sub>3</sub> Surface Treatment for Specialty Gases," Proceedings, <u>Microcontamination 93</u>, San Jose, pp. 596-605, September 1993.

- E416(C) Shinji Miyoshi, Tsutomu Kojima, Tetsuo Suenaga, Tadahiro Ohmi and Yasumitsu Mizuguchi, "Metal Fume-Free Welding Technology," Proceedings, Microcontamination 93, San Jose, pp. 606-615, September 1993.
- E417(C) Nobukazu Ikeda, Michio Yamaji, Tsutomu Shinohara and Tadahiro Ohmi, "Proposal of Fitting for the Development of Low Cost Ultra High Purity Gas Delivery Systems by the Achievement of Inspection Free Installation," Proceedings, <u>Microcontamination 93</u>, San Jose, pp. 616-624, September 1993.
- E418-1(C) K. Tomita, T. Migita, S. Shimonishi, Tadashi Shibata, Tadahiro Ohmi and Takahisa Nitta, "Eliminating Metal-Sputter Contamination in Ion Implanter for Low Reverse-Bias Current, 450°C-Annealed Junctions," Extended Abstracts, 184th Electrochemical Society Meeting, New Orleans, Abstract No. 282, pp. 461-462, October 1993.
- E418-2 (P) K. Tomita, T. Migita, S. Shimonishi, Tadashi Shibata, Tadahiro Ohmi and Takahisa Nitta, "Eliminating Metal-Sputter Contamination in Ion Implanter for Low Reverse-Bias Current, 450°C-Annealed Junctions," H. J. Queisser, J. E. Chung, K. E. Bean, T. J. Shaffner and H. Tsuya eds., The Degradation of Electronic Devices due to Device Operation as well as Crystalline and Process-Induced Defects, PV94-1, pp. 286-297, The Electrochemical Society, Pennington, NJ, 1994.
- E419-1(C) Tadahiro Ohmi, "Advanced Wet Chemical Cleaning for Future ULSI Fabrication," Extended Abstracts, <u>184th Electrochemical Society Meeting</u>, New Orleans, Abstract No. 302, pp. 495-496, October 1993.
- E419-2 (P) Tadahiro Ohmi, "Advanced Wet Chemical Cleaning for Future ULSI Fabrication," Jerzy Ruzyllo and Richard E. Novak eds., <u>Cleaning Technology in Semiconductor Device Manufacturing</u>, PV94-7, pp. 3-14, The Electrochemical Society, Pennington, NJ, 1994.
- E420-1(C) Hitoshi Morinaga, Takashi Futatsuki and Tadahiro Ohmi, "Behavior of Ultra Fine Metallic Particles (-10nm) on Silicon Wafer Surface," Extended Abstracts, <a href="Mailto:184th Electrochemical Society Meeting">184th Electrochemical Society Meeting</a>, New Orleans, Abstract No. 317, pp. 521-522, October 1993.
- E420-2 (P) Hitoshi Morinaga, Takashi Futatsuki and Tadahiro Ohmi, "Behavior of Ultra Fine Metallic Particles (-10nm) on Silicon Wafer Surface," Jerzy Ruzyllo and Richard E. Novak eds., <u>Cleaning Technology in Semiconductor Device Manufacturing</u>, PV94-7, pp. 458-465, The Electrochemical Society, Pennington, NJ, 1994.
- E421-1(C) K. Ino, I. Natori, A. Ichikawa and Tadahiro Ohmi, "In Situ Chamber Cleaning Using Halogenated-Gas Plasmas Evaluated by Extracted-Plasma-Parameter Analysis," Extended Abstracts, <u>184th Electrochemical Society Meeting</u>, New Orleans, Abstract No. 329, pp. 539-540, October 1993.
- E421-2 (P) K. Ino, I. Natori, A. Ichikawa and Tadahiro Ohmi, "In Situ Chamber Cleaning Using Halogenated-Gas Plasmas Evaluated by Extracted-Plasma-Parameter Analysis," Jerzy Ruzyllo and Richard E. Novak eds., <u>Cleaning Technology in Semiconductor Device Manufacturing</u>, PV94-7, pp. 339-346, The Electrochemical Society, Pennington, NJ, 1994.

- E422-1(C) K. Nakamura, T. Futatsuki, K. Makihara and Tadahiro Ohmi, "Ultra Thin Oxide Formation Using Chemical Oxide Passivation," Extended Abstracts, 184th Electrochemical Society Meeting, New Orleans, Abstract No. 343, pp. 563-564, October 1993.
- E422-2 (P) K. Nakamura, T. Futatsuki, K. Makihara and Tadahiro Ohmi, "Ultra Thin Oxide Formation Using Chemical Oxide Passivation," Jerzy Ruzyllo and Richard E. Novak eds., <u>Cleaning Technology in Semiconductor Device Manufacturing</u>, PV94-7, pp. 70-77, The Electrochemical Society, Pennington, NJ, 1994.
- E423-1(C) N. Yonekawa, S. Yasui, F. Kunimoto, Frederick W. Kern, Jr. and Tadahiro Ohmi, "Contamination Removal by Wafer Spin Cleaning Process with Advanced Chemical Distribution System," Extended Abstracts, <u>184th Electrochemical Society Meeting</u>, New Orleans, Abstract No. 346, pp. 569-570, October 1993.
- E423-2 (P) N. Yonekawa, S. Yasui, F. Kunimoto, Frederick W. Kern, Jr. and Tadahiro Ohmi, "Contamination Removal by Wafer Spin Cleaning Process with Advanced Chemical Distribution System," Jerzy Ruzyllo and Richard E. Novak eds., Cleaning Technology in Semiconductor Device Manufacturing, PV94-7, pp. 94-101, The Electrochemical Society, Pennington, NJ, 1994.
- E424(C) Hiroshi Ishii, Tadashi Shibata, Hideo Kosaka and Tadahiro Ohmi, "Hardware-Learning Neural Network LSI Using a Highly-Functional Transistor Simulating Neuron Action," <u>Proceedings, International Joint Conference on Neural Networks IJCNN'93</u>, Nagoya, pp. 907-910, October 1993.
- E425(C) Tadahiro Ohmi, "Global Collaboration for Future Scientific Semiconductor Manufacturing form the Stage of Research and Development," 1993 International Trade Partners Conference, (11pages), Maui, November 1993.
- E426(C) Tadahiro Ohmi and Tadashi Shibata, "Ultra Clean Technology Its Impact on High Integrity Ultra-Thin Gate Oxide Formation," <u>SEMICON/Korea Technical Symposium 93</u>, Seoul, pp. 195-202, November 1993.
- E427 (L) Takashi Matsuura, Junichi Murota, Yasuji Sawada and Tadahiro Ohmi, "Self-Limited Layer-by-Layer Etching of Si by Alternated Chlorine Adsorption and Ar<sup>+</sup> Ion Irradiation," <u>Applied Physics Letters</u>, Vol. 63, No. 20, pp. 2803-2805, November 1993.
- E428 (F) Masahiko Kogure, Takashi Futatsuki, Jun Takano, Tatsuhiko Isagawa, K. Kimura, Y. Ogata, F. Tanaka and Tadahiro Ohmi, "Influence of Organic Impurities in Hydrogen Peroxide for Advanced Wet Chemical Processing," <u>Journal of Electrochemical Society</u>, Vol. 140, No. 11, pp.3321-3326, November 1993.
- E429 (W) K. Yamada, K. Tomita, and T. Ohmi, "Silicon-Capping Silicidation Technology for Ultra-Low Contact Resistance Metallization," the 3rd Microelectronics Conference Proceeding, pp.209-219, November 1992.
- E430 (W) Hitoshi Morinaga, Takashi Futatsuki, Tadahiro Ohmi, Eiji Fuvhita, Masaaki Oda, and Chikara Hayashi, "Behavior of Ultra Fine Metallic Particles (-10nm) on Silicon Wafer Surface," the 3rd Microelectronics Conference Proceeding, pp.241-249, November 1992.

- E431 (W) Tadashi Shibata, and Tadahiro Ohmi, "Four-Terminal Device-Impact of a New Functional Transistor on Logic Integrated Circuits Implementation," the 3rd Microelectronics Conference Proceeding, pp.281-286, November 1992.
- E432(C) H. Yamada, T. Hoshi, T. Takewaki, T. Shibata, T. Ohmi, and T. Nitta, "Evaluation of Electromigration and Stressmigration Reliabilities of Copper Interconnects by a Simple Pulsed-Current Stressing Technique," <u>Technical Digest, International Electron Devices Meeting 1933</u>, Washington, DC, pp. 269-272, December 1993.
- E433(C) H. Kosaka, Tadashi Shibata, H. Ishii and Tadahiro Ohmi, "An Excellent Weight-Updating-Linearity Synapse Memory Cell for Self-Learning Neuron MOS Neural Network," <u>Technical Digest, International Electron Devices Meeting 1993</u>, Washington, DC, pp. 623-626, December 1993.
- E434(C) Tadahiro Ohmi, "High-Quality Gate Oxide Films Based on Ultraclean Technology," 24th IEEE Semiconductor Interface Specialists Conference, Ft. Lauderdale, paper1.1, (2pages), December 1993.
- E435 (P) Fumitomo Kunimoto, Tadahiro Ohmi and Frederick W. Kern, Jr., "Metal Removal by Wafer Spin Cleaning Process with Advanced Chemical Distribution System," Gregg S. Higashi, Eugene A. Irene and Tadahiro Ohmi, eds., Materials Research Society Symposium Proceedings Vol. 315, Surface Chemical Cleaning and Passivation for Semiconductor Processing, pp. 313-320, 1993.
- E436 (P) Hideki Aomi, Francois Derouin and Tadahiro Ohmi, "The Adhesion and the Protection of Metallic Impurities at the Interface of Si Wafer Surface with Anion Species," Gregg S. Higashi, Eugene A. Irene and Tadahiro Ohmi, eds., Materials Research Society Symposium Proceedings Vol. 315, Surface Chemical Cleaning and Passivation for Semiconductor Processing, pp. 333-337, 1993.
- E437 (P) Jun Takano, Koji Makihara and Tadahiro Ohmi, "Chemical Oxide Passivation for Very Thin Oxide Formation," Gregg S. Higashi, Eugene A. Irene and Tadahiro Ohmi, eds., <u>Materials Research Society Symposium Proceedings Vol.</u> 315, Surface Chemical Cleaning and Passivation for Semiconductor Processing, pp. 381-386, 1993.
- E438 (P) Shintaro Aoyama and Tadahiro Ohmi, "Texture Analysis of Si(100) and Si(111) Surfaces Using Autocovariance of AFM Images," Gregg S. Higashi, Eugene A. Irene and Tadahiro Ohmi, eds., <u>Materials Research Society Symposium Proceedings Vol. 315</u>, Surface Chemical Cleaning and Passivation for Semiconductor Processing, pp. 417-422, 1993.
- E439(C) Tadahiro Ohmi, "Material Innovation for Flexible Programmable and Intelligent ULSI System in 21st Century," <u>Materials Research Society Symposium Proceedings Vol. 318, Interface Control of Electrical, Chemical, and Mechanical Properties, pp. xxiii-xxix, Boston, Mass. December 1993.</u>
- E440 (F) Tadahiro Ohmi and Tadashi Shibata, "Advanced Scientific Semiconductor ProcessingBased on High-Precision Controlled Low-Energy Ion Bombardment," Thin Solid Films, Vol. 241, pp. 159-166, 1993.

E441 (F) Tadahiro Ohmi, Takashi Imaoka, Jun Takano and Fumitomo Kunimoto, "Improved Wet Chemical Cleaning for Realization of Ultra Clean Wafer Surface," <u>Particulate Science and Technology (an International Journal)</u>, Vol. 11, No. 3-4, pp. 229-243, July-December 1993.