

## 9 Scientific publications 2004

**Amro, R.; J.Lutz, A.Lindemann:** "Evaluation of a DCB based Transfer Molded Component for Application with High Temperature Swings" PCIM Europe 2004, Nuremberg, Germany

**Amro, R.; J.Lutz, A.Lindemann:** "Power Cycling with High Temperature Swing of Discrete Components based on Different Technologies" Proceedings of the 35<sup>th</sup> IEEE Power Electronics Specialists Conference, S. 2593 - 2598, Aachen (2004)

**Bagdahn, J.; Wiemer, M.; Bernach, M.; Petzold, M.:** "Characterisation of mechanical properties of directly bonded silicon after low and high temperature annealing", 1st workshop on wafer bonding for MEMS technologies, 10th to 12th October 2004, Halle, Germany

**Baum, M.:** Optical devices and biomedical application, A\*Star IZM Workshop, Singapore, 8.11.04

**Belsky, P.; Streiter, R.; Wolf, H.; Gessner, T.:** „Application of Molecular Dynamics to the Simulation of IPVD“, presented at AMC 2004, San Diego, USA, Oct. 19-21, 2004

**Blaschta, F.; Schulze, K.; Schulz, S.; Gessner, T.:** SiO<sub>2</sub> aerogel ultra low k dielectric patterning using different hard mask concepts and stripping processes. Microelectronic Eng., 76 (2004) pp 8-15

**Bonitz, J.; Schulz, S.E.; Gessner, T.:** Ultra thin CVD TiN layers as diffusion barrier films on porous low-k materials, Microelectronic Eng. 76, (2004)1-4, pp 82-88

**Diefenbach, K.-H.; Erler, K.; Mrwa, A.; Denissov, S.; Ebest, G.; Rindelhardt, U.:** Emitter Formation at RIE textured Surfaces, 10th PVSEC, Paris, June 7-11, 2004

**Ecke, R.; Schulz, S.E.; Hecker, M.<sup>1</sup>; Engelmann, H.-J.<sup>2</sup>; Gessner, T.:** W(Si)N Diffusion Barriers for Cu Metallization deposited by PECVD, Advanced Metallization Conference AMC 2004, San Diego, USA, Oct. 19-21, 2004.

<sup>1</sup> Institute for Solid State and Materials Research, 01069 Dresden, Germany

<sup>2</sup> AMD Saxony LLC & Co KG, 01330 Dresden, Germany

**Frömel, J.; Billep, D.; Wiemer, M.:** Application of micromechanical resonant structures for measuring the sealing of bonded sensor systems. Workshop on Wafer Bonding for MEMS Technologies, 10th to 12th October 2004, FhG-IWM Halle, Germany

**Frühauf, J.; Krönert, S.:** Linear Silicon Gratings with Different Profiles: Trapezoidal, Triangular, Rectangular, Arched. Proc. Of the XI. International Colloquium on Surfaces, Chemnitz, Germany 2.-3. February 2004, Proceedings Part II 75-83, Shaker-Verlag Aachen 2004

**Frühauf, J.; Krönert, S.; Brand, U.; Krüger-Sehm, R.:** Reachable precision of silicon dimensional standards. Proceedings of the EUSPEN, p. 217, Glasgow 2004

**Frühauf, J.; Gärtner, E.; Brand, U.; Doering, L.:** Silicon springs for the calibration of the force of hardness testing instruments and tactile profilometers. Proceedings of the EUSPEN, p. 362, Glasgow 2004

**Frühauf, J.:** Ätzmasken-Entwurf und Simulation des kristallorientierungsabhängigen Silizium-Ätzens. Tagungsband 10. GMM-Workshop Methoden und Werkzeuge zum Entwurf von Mikrosystemen (Herausg. B. Falter; W. John), Cottbus 2004, S. 19-23

**Frühauf, S.; Schulz, S.E.; Gessner, T.:** Integrationspotential mesoporöser SiO<sub>2</sub>-Schichten als ultra-low-k Dielektrikum. Vakuum in Forschung und Praxis, 16 (2004) pp. 194-198

**Geiger, W., Breng, U., Deppe-Reibold, O., Fuchs, W., Gutmann, W., Hafen, M., Handrich, E., Huber, M., Kunz, J., Leinfelder, P., Newzella, A., Ohmberger, R., Ruf, M., Schröder, W., Spahlinger, G., Rasch A. LITEF GmbH, Freiburg ; Hiller, K., Billep, D. Chemnitz University of Technology:** Test Results of the Micromechanical Coriolis Rate Sensor  $\mu$ CORS II, DGON 2004 Symposium Gyro Technology, Stuttgart 2004

**Gessner, T.:** “Advanced Silicon Micromachining Technologies”, MEMS Workshop, Industrial Technology Research Institute ITRI, March 1, 2004, Taiwan

**Gessner, T.:** “MEMS Metallization”, Invited Talk, MRS Spring Meeting 2004, April 12-16, San Francisco, USA

**Gessner, T.; Schulz, S.E.:** “Selected Challenges for Advanced Interconnect Systems”, Invited Talk, E-MRS 2004, May 24-28, Strasbourg, France

**Gessner, T.; Hiller, K.; Hübler, A.; Kurth, S.:** „Micro Scanners for Spectrum Analysis Systems“, Invited Talk, Actuator 2004, June 14, Bremen, Germany

**Gessner, T.:** “Microsystems Technologies”, Leipziger Messe Z 2004, 23. Juni 04, Leipzig, Germany

**Gessner, T.:** „Copper Metallization systems and low k dielectrics“, Joint Workshop on Materials for Advanced Interconnects, Fudan University Shanghai, July 13-14, 2004, Shanghai, China

**Gessner, T.:** “Mikroelektronik- und Mikrosystemtechnik-Forschung am Zentrum für Mikrotechnologien der Technischen Universität Chemnitz in Kooperation mit dem Fraunhofer IZM”, Kolloquium am ZMN Ilmenau, 30. Juli 2004, Ilmenau, Germany

**Gessner, T.:** “Microelectronics and MEMS: Challenges for the Technology Transfer into the Industry within the Fraunhofer Organization”, MINAPIM 2004, September 15-18, Manaus, Amazonas, Brazil

**Gessner, T.:** “The Scientific System in Germany – Universities, Max-Planck-Institutes, Fraunhofer Organization, Leibniz-Foundation and Helmholtz-Foundation”, Workshop at Chongqing University, October 12, 2004, Chongqing, China

**Gessner, T.; Otto, T.; Wiemer, M.; Frömel, J.:** Wafer Bonding in Micro Mechanics and Microelectronics – An Overview, pp. 307-313, Anniversary book for Prof. Dr. H. Reichl’s 60th birthday, ed. B. Michel & R. Aschenbrenner, 2004

**Gessner, T.:** “Technology Approaches for Inertial Sensors”, Invited Talk, ISINTIT 2004, October 15-16, 2004, Nanjing, China

**Gessner, T.:** „Mikrosysteme im Automobil“, Chemnitzer Automobiltagung, TU Chemnitz, Oct. 21, 2004, Chemnitz, Germany

**Gessner, T.:** „Systems Integration – A Challenge for Micro- and Nanotechnologies“, Kolloquium „caesarianum“, October 26, 2004, Stiftung caesar, Bonn, Germany

**Gessner, T.:** Challenges and trends for advanced interconnect systems – contribution and experiences of TU Chemnitz / ZfM and FhG-IZM Chemnitz, AMD-Silicon Saxony, Dresden, November 3, 2004

**Gessner, T.:** „Microelectronics and MEMS: Overview about FhG-IZM and the Fraunhofer Organization“, A\*Star IZM Workshop, IME Singapore, 8.11.04

**Gessner, T., Bertz, A.; Lohmann, C.; Wiemer, M.; Kurth, St.; Hiller, K.:** „Advanced Silicon Micromachining Technologies“, Suss MEMS Seminar ; Institute of Microsystem and Information Technology, Chinese Academy of Science, Shanghai, China, November 12, 2004

**Gessner, T.; Hiller, K.; Bertz, A.:** MEMS for automotive applications, Nanofair 2004, VDI-Berichte 1839, pp. 77-82

**Hammer, K.; Heinz, S.; Zeun, H.; Ebest, G.:** Using of High-end Design Tools in Education. Proceedings Conference Applied Electronics 2004, Pilsen (Tschechien), 2004 Sep 8-9 pp 64-67

**Hanf, M., Dötzel, W.:** Characterization of charges in MEMS devices, Actuator 2004, Bremen, Germany, pp. 498-501

**Hanf, M., Kurth, S., Billep, D., Hahn, R., Faust, W., Heinz, S., Dötzel, W., Gessner, T.:** A Dynamically Driven Micro Mirror Array as Light Modulator in a Hadamard Transform Spectrometer (HTS), Eurosensors XVIII, Roma, Italy, 09/2004,

**Hanf, M., Dötzel, W.:** „Micromechanical electrostatic field sensor for the detection of surface charges“, Proc. of the EUROSENSORS XVII, pp.374-375, Guimaraes, Portugal 2004, Sensors and Actuators 10/2004

**Hanf, M., Markert, J., Dötzel, W.:** „Measurement and evaluation of surface of micro mechanical mirror structures“, XI. Internationales Colloquium on Surfaces, 2. & 3. Febr. 2004 Chemnitz

**Herrmann, G.; Müller, D.:** ASIC – Entwurf und Test. Fachbuchverlag Leipzig, Carl Hanser Verlag, Januar 2004

**Herrmann, G.; Dost, G.:** Entwurf und Technologie von Mikroprozessoren. in: Beierlein, T.; Hagenbruch, O. (Hrsg.): Taschenbuch Mikroprozessortechnik. Fachbuchverlag Leipzig im Carl Hanser Verlag München Wien, Mai 2004

**Himcinschi, C.; Friedrich, M.; Frühauf, S.; Schulz, S.E.; Gessner, T.; Zahn, D.R.T.:** Contributions to the static dielectric constant of low-k xerogel films derived from ellipsometry and IR spectroscopy. Thin Solid Films, 455-456 (2004) pp 433-437

**Jerinic, V.; Müller, D.:** Safe integration of parameterized IP. in: Integration, the VLSI journal, 37 (2004), ELSEVIER B. V., pp. 193-221

**Jia, Ch.; Wiemer, M.; Gessner, T.:** “Low temperature direct bonding with on wafer metal interconnections“, 1st workshop on wafer bonding for MEMS technologies, 10th to 12th October 2004, Halle, Germany

**Knechtel, R.; Wiemer, M.; Knaup, M.; Bagdahn, J.:** „An non-destructive test structure for bond strength evaluation in silicon-glass bonds“, 1st workshop on wafer bonding for MEMS technologies, 10th to 12th October 2004, Halle, Germany

**Knechtel, R.; Wiemer, M.; Frömel, J.:** “Wafer level encapsulation of microsystems using glass frit bonding“, 1st workshop on wafer bonding for MEMS technologies, 10th to 12th October 2004, Halle, Germany

**Körner, H.<sup>1</sup>; Büyüktas, K.<sup>1</sup>; Eisener, B.<sup>1</sup>; Liebmann, R.<sup>1</sup>; Schulz, S.E.; Seidel, U.<sup>1</sup>; Gessner, T.:** Impact of Ultra Low k dielectrics on RF-Performance of Inductors, Talk at the Advanced Metallization Conference AMC 2004, San Diego, USA, Oct. 19-21, 2004.

<sup>1</sup> Infineon Technologies AG, Otto-Hahn-Ring 6, 81739 Munich, Germany

**Kretzschmar, C.; Siegmund, R.; Müller, D.:** Adaptive Bus Line Grouping for Power Efficient Data Transfer over Wide System Buses. GI/ITG/GMM Workshop: Methoden und Beschreibungssprachen zur Modellierung und Verifikation von Schaltungen und Systemen, Kaiserslautern (D), 23.-25. Februar 2004

**Kretzschmar, C.; Nieuwland, A. K.; Müller, D.:** Why Transition Coding for Power Minimization of on-Chip Buses does not work. Design Automation and Test in Europe (DATE), Paris (France), 16.-20. Februar 2004

**Kretzschmar, C.; Bitterlich, T.; Müller, D.:** A High-Level DSM Bus Model for Accurate Exploration of Transmission Behaviour and Power Estimation of Global System Buses. Integrated Circuit and System Design, Power and Timing Modeling, Optimization and Simulation, 14th International Workshop, PATMOS, Santorini (Greece), 15.-17. September 2004

**Kretzschmar, C.; Scheithauer, M.; Müller, D.:** Adaptive Bus Encoding Schemes for Power-efficient Data Transfer in DSM Environments. IFIP Working Conference on Distributed and Parallel Embedded Systems (DIPES), Toulouse (France), 23.-26. August 2004, Kluwer Academic Publishers, Boston, USA

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**Kurth, S.:** Test, Charakterisierung und Zuverlässigkeit mikromechanischer Komponenten, MEMUNITY Workshop, Waldbronn, März 2004

**Leidich, S.; S. Voigt, S. Kurth, B. Rawat, Gessner, T.:** Microwave Phase Shifter in Bulk Micro Mechanic Technology, Proc. of Int. Conference Applied Electronics 2004, Plzen

**Lohmann, C.; Gottfried, K.; Bertz, A.; Reuter, D.; Hiller, K.; Kuhn, M.; Gessner, T.:** MEMS Metallization. Materials, Technology and Reliability for Advanced Interconnects and low-k Dielectrics, 2004 (Eds. R.J.Carter, C.S.Hau-Riege, G.M.Kloster, T.-M. Lu, S.E.Schulz), MRS Symp. Proc. 812 (2004), pp 233-242

**Lohmann, C.; Reuter, D.; Bertz, A.; Gessner, T.:** High Aspect Ratio Micromachining using the AIM Technology, Anniversary book for Prof. Dr. H. Reichl's 60th birthday, pp. 544-548, ed. B. Michel & R. Aschenbrenner, 2004

**Markert, E.; Schlegel, M.; Herrmann, G.; Müller, D.:** Beschreibung von mechatronischen Systemen mit SystemC-AMS. 10. GMM-Workshop „Methoden und Werkzeuge für den Entwurf von Mikrosystemen“, Cottbus, 20.-22. Oktober 2004, p. 59 ff.

**Mehner, J.:** MEMS design, simulation and modelling,, A\*Star IZM Workshop, Singapore, 8.11.04

**Mehner, J.; Dötzel, W.; Gessner, T.:** Advanced Technologies for Microsystems Design, pp. 241-245, Anniversary book for Prof. Dr. H. Reichl's 60th birthday, ed. B. Michel & R. Aschenbrenner, 2004

**Müller, A.-D.; Müller, F.; Mehner, J.; Gessner, T.; Hietschold, M.:** Sensor-actuator arrays for dynamic Atomic Force Microscopy and their application in temporary MESFET devices, Actuators 2004, Proc.of 9th Int. Conf. on New Actuators, pp. 775-777, Bremen (Germany)

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**Otto, T.; Saupe, R.; Kaufmann, C.; Gessner, T.:** Infrared Micro Mirror Spektrometer for Gas Analysis. Actuator 2004, 9th International Conference on New Actuators, Bremen (Germany), 2004 June 14-16; Proceedings, pp. 254-257

**Otto, T.; Saupe, R.; Stock, V.; Fritsch, U.; Bruch, R.; Gessner, T.:** Packaging and Characterization of Miniaturized Spectral Sensing Devices. SPIE Photonics West: MOEMS and Miniaturized Systems IV, San Jose (USA), 2004 Jan 27-28; Proc. of SPIE, 5346 (2004) pp. 134-140

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**Puschmann, R.; Schwarzer, N.; Richter, F.; Frühauf, S.; Schulz, S.E.:** A usable concept for the indentation of thin porous films. NanoMech Workshop, Hückelhoven, 2004 Sep

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**Schlegel, M.; Herrmann, G.; Müller, D.:** Eine neue Hardware-Komponente zur Fuzzy-Pattern-Klassifikation. Dresdener Arbeitstagung Schaltungs- und Systementwurf DASS'04, Dresden, 19.-20. April 2004, pp. 21-26

**Schlegel, M.; Herrmann, G.; Müller, D.:** Erweiterte Kostenmodellierung mit VHDL/VHDL- AMS. GI/ITG/GMM-Workshop: Methoden und Beschreibungssprachen zur Modellierung und Verifikation von Schaltungen und Systemen, Kaiserslautern, 24.-25. Februar 2004, Berichte aus der Informatik, Shaker Verlag, Aachen 2004, pp. 147-155

**Schlegel, M.; Bennini, F.; Mehner, J.; Herrmann, G.; Müller D.; Dötzel, W.:** Analyzing and Simulation of MEMS in VHDL-AMS Based on Reduced Order FE-Models. accepted for IEEE Sensors Journal

**Schröter, B.; Mehner, J.; Hiller, K.; Gessner, T., Dötzel, W.:** A Novel Microactuator Based on the Working Principle of a Step-by-Step Switchgear. In: ACTUATOR 04, Bremen, 2004, pp. 242-245

**Schulz, S.E.:** CVD Thin Films for Barrier, Hard Mask, Etch and CMP Stop Application, Short Course Lecture, Advanced Metallization Conference AMC 2004, San Diego, USA, Oct. 18, 2004.

**Schulz, S.E.; Blaschta, F.; Eisener, B.; Frühauf, S.; Schulze, K.; Seidel, U.; Körner, H.; Gessner, T.:** SiO<sub>2</sub> Aerogel ULK Integration into Copper Damascene Interconnects for RF Devices, AMC Conference 2003, Conf. Proc. AMC XIX MRS Warrendale PA 2004, pp 97-105

**Schulz, S.E.; Ecke, R.:** Advanced CVD Technology for Diffusion Barrier and Cu Deposition, Invited Talk 3<sup>rd</sup> International Semiconductor Technology Conference (ISTC 2004) Shanghai, China 2004, September 15-17

**Schulz, S.E.; Gessner, T.:** Ultra thin CVD TiN layers as diffusion barrier films on porous low-k materials. *Microelectronic Engineering*, 76 (2004), pp. 82-88

**Schulze, K.; Schulz, S.E.; Frühauf, S.; Körner, H.; Seidel, U.; Schneider, D.; Gessner, T.:** Improvement of mechanical integrity of ultra low k dielectric stack and CMP compatibility. *Microelectronic Engineering*, 76 (2004) pp. 38-45

**Shaporin, A., Kolchuzhin, V., Mehner, J., Dötzel, W.:** Parametric Variational Finite Element Method for MEMS Electrostatic Problems, Proc on 10. GMM Cottbus, Germany (2004), pp. 39-46,

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**Zeun, H.; Uhle, J.; Heinz, S.; Ebest, G.:** Hochohmige Polysilizium-Widerstände in integrierten Hochvolt-Schaltungen. 10. GMM-Workshop "Methoden und Werkzeuge zum Entwurf von Mikrosystemen", Cottbus, 2004 Okt 20-22 pp. 227-230

**Zimmermann, S.; Ecke, R.; Rennau, M.; Schulz, S.E.; Hecker, M.; Voss, A.; Engelmann, H.-J.; Mattern, N.; Zschech, E.; Gessner, T.:** Characterisation of a PECVD WN<sub>x</sub> Barrier Layer against Copper Diffusion, AMC Conference 2003, Conf. Proc. AMC XIX MRS Warrendale PA 2004, pp 397-402

## 10 Guests & special international relations

### Guests from:

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|------------------|--|
| January 13       | Prof. R. Bruch, University of Nevada, Reno   |
| February & March | Prof. Zhuyi Wen, Chongqing University, China   |
| February 19      | Dr. Koichi Ohtaka, Takahito Uga, Ikuo Katoh, Ricoh Comp. Ltd., Japan   |
| March 22         | Mr. Natsuki Yokoyama, Hitachi Ltd., Tokyo, Japan   |
| March 30         | Valentin Kahl, ibidi GmbH, München   |
| March 31         | Mrs. Annie Roulleau, Fa. Sagem, St. Etienne, Frankreich<br>Mr. Philipe Pougnet, Johnson Controls, Cerey-Pontoise, Frankreich |
| May 8            | Prof. R. Bruch, University of Nevada, Reno, USA  |
| May 10           | Prof. J. Morris, Portland State University, Portland, USA  |