

Selected publications of department Components in Microelectronics and Micro System Technologies since 2008

Semiconductor technology, wafer level

1. Gu D, Naumann F, Petzold M, Zhu M and Baumgart H; Investigation of strain relaxation in patterned strained silicon-on-insulator structures by Raman spectroscopy and computer simulation; Proceed. 2009 International Semiconductor Device Research Symposium ISDRS (2009) 1 – 2
2. D. Gu, H. Baumgart, F. Naumann, and M. Petzold, Finite Element Modeling and Raman Study of Strain Distribution in Patterned Device Islands on Strained Silicon-on-Insulator (sSOI) Substrates, ECS Transactions 33 (2010), 529-535
3. Moutanabbir, S. Christiansen, S. Senz, R. Scholz, M. Petzold and U. Gösele, III-V and III-Nitride engineered heterostructures: wafer bonding, ion slicing and more, ECS Transactions 16, (8) (2008), 251-262
4. Moutanabbir, M. Reiche, N. Zakharov, A. Hähnel, W. Erfurth, F. Naumann, M. Petzold, M. Holt, J. Maser and U. Gosele, Probing the Strain States in Nanopatterned Strained SOI, ECS Trans. 25 (3) (2009), 187 -194
5. Moutanabbir O, Reiche M, Erfurth W, Naumann F, Petzold M and Gosele U; The complex evolution of strain during nanoscale patterning of 60 nm thick strained silicon layer directly on insulator Applied Physics Letters 94 (2009) 243113-1-4
6. Moutanabbir, O.; Reiche, M.; Hahnel, A.; Erfurth, W.; Motohashi, M.; Tarun, A.; Kawata, N. S.; Naumann, F.; Petzold, M.; Holt, M.; Maser, J. Strain Stability in Nanoscale Patterned Strained Silicon-on-Insulator, ECS Transactions 33 (2010), 511-522
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10. M. Reiche, O. Moutanabbir, C. Himcinschi, S. Christiansen, W. Erfurth, U. Gösele, S. Mantl, D. Buca, Q.T. Zhao, R. Loo, D. Nguyen, F. Muster, and M. Petzold, Strained Silicon on Wafer Level by Wafer Bonding: Materials Processing, Strain Measurements and Strain Relaxation, ECS Transactions 16, (8) (2008), 311-320
11. K. Tapily, H. Baumgart, D. Gu, A. Elmustafa, M. Krause and M. Petzold, Effect of Wafer Bonding and Layer splitting on Nanomechanical Properties of standard and strained SOI Films, ECS Transactions 16, (8) (2008) 337-345

System in Package (SiP) and 3D Integration

12. F. Altmann, C. Schmidt, S. Brand, P. Czurratis, M. Petzold Failure Diagnostics for 3D System Integration Technologies in Microelectronics, ECS Transactions 33 (4) (2010) 47-57
13. Altmann, F.; Petzold, M.; Schmidt, C.; Salzer, R.; Cassidy, C. ; Tesch, P. ; Characterization and Failure Analysis of 3D Integrated Semiconductor Devices- Novel Tools for Fault Isolation, Target Preparation and High Resolution Material Analysis, Proc. of. 36th International symposium for Testing and Failure Analysis, Dallas, ISTFA 2010, 163-170
14. S. Brand, M. Petzold, P. Czurratis, J. D. Reed, M. Lueck, C. Gregory, A. Huffman, J. M. Lannon Jr., and D. S. Temple High Resolution Acoustical Imaging of High-Density-Interconnects for 3D-Integration, accepted for ECTC 2011
15. J. Kraft, F. Schrank, J. Teva, J. Sieger, G. Koppitsch, C. Cassidy, E. Wachmann, F. Altmann, S. Brand, C. Schmidt, M. Petzold 3D sensor integration with open TSV technology, accepted for ECTC 2011
16. M. Krause, F. Altmann, C. Schmidt, S. Brand, M. Petzold, D. Malta, D. Temple Characterization and failure analysis of TSV interconnects: from non-destructive defect localization to material analysis with nanometer resolution, accepted for ECTC 2011
17. D. Malta, C. Gregory, M. Lueck, D. Temple, M. Krause, F. Altmann, and M. Petzold Characterization of Thermo-Mechanical Stress and Reliability Issues for Cu-Filled TSVs, accepted for ECTC 2011
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19. Petzold M, Altmann F, Krause M, Salzer R, Schmidt C, Martens S, Mack W, Dömer H and Nowodzinski A; Micro Structure Analysis for System in Package Components - Novel Tools for Fault Isolation, Target Preparation, and High-resolution Material Diagnostics Proceedings, Proc. IEEE 60th Electronic Components and Technology Conference (ECTC) (2010) 1296-302
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Material characterization in microelectronic components, modules and assemblies

25. Altenbach, H.; Dresbach, Ch.; Petzold, M. Characterizing the Anisotropic Hardening Behavior of Aluminum Bonding Wires, Key Engineering Materials, 2011, in press
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27. Bennemann, S.; Simon, M.; Petzold, M.; Altmann, F Fehlermechanismen an Leiterplattenmetallisierungen für bleifrei gelötete Packageaufbauten, DVS Berichte Band 295, 2010, 246-250
28. Boettcher, T.; Rother, M.; Liedtke, S.; Ullrich, M.; Bollmann, M.; Pinkernelle, A.; Gruber, D.; Funke, H-J.; Kaiser, M.; Lee, K.; Li, M.; Leung, K.; Li, T.; Farrugia, M-L.; O'Halloran, O.; Petzold, M.; März, B.; Klengel, R., Intermetallic Corrosion of Cu-Al wire bonds, Proceedings 12th Electronics Packaging Technology Conference - Singapore (EPTC 2010), 585-590
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34. Klengel R, Bennemann S, Schischka J, Grosse C, and Petzold M; Advanced Failure Analysis Methods and Microstructural Investigations of Wire Bond Contacts for Current Microelectronic System Integration, Proc. European Microelectronics and Packaging Conference (EMPC) (2009), Vols 1 and 2, 682-687
35. Krause M, Müller M, Petzold M, Wiese S and Wolter K J; Scaling effects on grain size and texture of lead free interconnects - investigations by electron backscatter diffraction and nanoindentation, Proc. 58th Electronic Components and Technology Conference (ECTC) (2008) 75-81

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MEMS characterization, strength properties of semiconductor wafers and chips

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Material characterization in Bio- and Nanotechnology

57. Lee S M, Grass G, Kim G M, Dresbach C, Zhang L B, Gösele U and Knez M; Low-temperature ZnO atomic layer deposition on biotemplates: flexible photocatalytic ZnO structures from eggshell membranes *Physical Chemistry Chemical Physics* 11 (2009) 3608 - 3614
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Development of methods and device components in microstructure diagnostics, failure analysis, quality surveillance and testing

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83. Wendt J, Träger M, Klengel R, Petzold M, Schade D and Sykes R; Improved quality test method for solder ribbon interconnects on silicon solar cells, Proc. 12th IEEE Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITHERM) (2010) 4 pp.