

11th International Workshop on Stress-Induced Phenomena in Metallization, Dresden/Bad Schandau 2010

Monday, 12th April 2010

Tuesday, 13th April 2010

Wednesday, 14th April 2010

08:15 - 08:30 am Opening remarks

Session 1: Sub-100nm metal interconnects: Scaling effects Chair: Paul S. Ho			
T1	08:30	George Pharr, University of Tennessee, US	Measurement of elastic modulus and residual stress in thin metallic films by nanoindent. and thin film bridges
T2	09:05	C. K. Hu, IBM Yorktown/NY, US	Effect of impurity on Cu electromigration
T3	09:40	Oliver Auel, Globalfoundries, Dresden/Germany	Stress phenomena in times of porous low-k dielectrics
10:15 - 10:45 am Break			
Session 2: Advanced nanoscale materials and structures Chairs: Kazuhiro Ito			
T4	10:45	Kaz Hirakawa, University of Tokyo/Japan	Elementary process of electromigration at metallic nanojunctions in the ballistic regime
T5	11:20	Gunther Richter, MPI Stuttgart, Germany	Synthesis of metallic nanowires
Lunch			
Session 3: Microstructure of Cu interconnects Chair: Alex Dommann			
T6	01:30	Paul S. Ho, UT Austin/TX, US	Effect of cap layer and grain size on electromigration reliability of Cu/low-k interconnects for 45nm technology node
T7	02:05	Katayun Barnak, Carnegie Mellon University, US	Experimental studies on interfacial and grain boundary scattering in Cu
T8	02:40	King-Ning Tu, UCLA, US	Improved interconnect properties for nanotwinned copper: Microstructure and stability
3:15 - 3:45 pm Break			
T9	03:45	Chien-Neng Liao, National Tsing Hua University, Taiwan	Electromigration studies at surfaces and grain boundaries using in-situ TEM
T10	04:20	Rene Huebner, Fraunhofer IZFP, Dresden, Germany	Small grain characterization in sub-100nm Cu interconnect structures using OIM in the TEM
T29	04:55	K. J. Ganesh, UT Austin/TX, US	Correlating texture with thermal stress induced void formation in nano copper interconnects
07:00 Poster session and BBQ Chair: Ehrenfried Zschech			

Session 4: Metal films on polymer substrates Chair: Reinhard Dauskardt			
T11	08:30	Joost J. Vlassak, Harvard University, US	Highly stretchable metallic and ceramic films on polyimide substrates
T12	09:05	Sigurd Wagner, Princeton University, US	Making gold elastic and silicon dioxide flexible
T13	09:40	Johan Hoefnagels, Eindhoven University of Technology, Netherlands	Copper-rubben interface delamination in stretchable electronics
10:15 - 10:45 Break			
Session 5: Cu interconnect integration: Materials and reliability Chair: Valeriy Sukharev			
T14	10:45	Junichi Koike, Tohoku University, Sendai, Japan	Cu-Mn self-forming barrier and CVD-MnOx barrier for advanced interconnect structures
T15	11:20	Paul Besser, Unity Semi/CA, US	Stress gradients in capped Cu films
Lunch			

01:00 - 05:00 pm Walking tour (hiking)

Session 6: Advanced X-ray characterization techniques Chair: Jon Molina			
T16	05:00	Juan J. Perez-Camacho, Intel, Ireland	Some challenges in strain metrology for IC manufacturing: The case of X-ray topography
T17	05:35	Michael Feser, Xradia, Concord/CA, US	X-ray tomography at on-chip and 3D interconnects: A new failure localization technique
T18	06:10	Perroud Olivier, CNRS Marseille/France	Local stress determination using μ -Laue diffraction in Cu MEMS struct.
T19	06:45	Alex Dommann, CSEM Neuchatel/Switzerland	Quality control on strained semiconductor devices

08:00 pm Conference dinner

Session 7: Ultra low-k dielectrics: Materials and reliability Chair: Robert Ronseberg			
T20	08:30	Reinhard Dauskardt, Stanford University, US	Mechanical properties of hybride glass films: Computational models and experiments
T21	09:05	Xiao-Hu Liu, IBM Yorktown/NY, US	Integration and reliability impact of mechanical properties of ultra low-k dielectrics beyond 32 nm technology
T22	09:40	Mirosław Miller, TU Wrocław, Poland	Advanced nanoporous functional layer materials with extremely low dielectric constant
10:15 - 10:45 Break			
Session 8: Packaging: Materials and reliability Chair: King-Ning Tu			
T23	10:45	Minhua Lu, IBM Yorktown/NY, US	Effect of Sn grain orientation and alloy doping on the electromigration degradation mechanism for Sn-based Pb-free solders
T24	11:20	Rui Huang, UT Austin/TX, US	Thermomechanical reliability challenges for 3D interconnects
Lunch			
Session 9: TSV structures: Materials, modeling and characterization Chair: Shinichi Ogawa			
T25	01:30	Armin Klumpp, Fraunhofer IZM, Munich, Germany	Through Silicon Via technology and SLID assembly for integrated systems
T26	02:05	Geert van der Plas, IMEC Leuven, Belgium	3D integration with Cu TSV: Technology, design and stress
T27	02:40	Valeriy Sukharev, Mentor Graphics/CA, US	Stress-induced effects caused by TSV packaging on advanced semiconductor processes
T28	03:15	Robert Geer, Nanotech Albany/NY, US	Profiling of process-induced stress in Cu TSVs for wafer-scale 3D integration

03:40 - 04:00 pm Closing remarks

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Monday, 13th April 2010 - Poster session

P1	K. Weide-Zaage	Influence of the activation energy of the different migration effects on failure locations in metallizations
P2	H. Ceric	General approach for multi-scale electromigration TCAD
P3	M. Kraatz	Computer simulation of the effects of cap layer and microstructure on electromigration reliability of on-chip interconnects
P4	J. Poppe	Investigation of SIV voiding of double cross-shaped Kelvin SM test structures for deep sub-micron technology nodes
P5	S. Wege	Determination of residual stress of third order from Kossel- or EBSD-pattern
P6	C. J. Wilson	Simulation of the effect of microstructure on the elastic properties of copper interconnects
P7	C. J. Wilson	Design and application of a sensor to monitor stress in deep submicron copper interconnects
P8	M. Krause	Strain determination using Electron Backscatter Diffraction
P9	R. Galand	Electron Backscattered Diffraction analysis of narrow copper interconnects in cross-view to investigate scale effect on microstructure
P10	M. Smolka	Temperature dependent micro tensile test of freestanding copper thin film structures
P11	S. Niese	Assessment of mechanical properties of film interfaces and nanoscale structures for microprocessor manufacturing
P12	A. Neels	Advanced stress, strain and geometrical analysis in semiconductor devices
P13	S. Kamiya	Micro-scale evaluation of interface strength on patterned structures in LSI interconnects
P14	K. Ito	Application of Ti-based self-formed barrier layers to Cu dual-damascene interconnects for 28-nm node and beyond
P15	H. Hermann	Optimization of dielectric and elastic properties of nanoporous ultra low-k dielectric materials

P16	A. M. Urbanowicz	Improving mechanical robustness of ultra low-k SiOCH PECVD materials
P17	K. B. Yeap	Determining cohesive toughness and adhesion of low-k film by nanoindentation
P18	U. Hangen	Stress-induced effects in semiconductors observed by nanoindentation and concurrent electrical measurements
P19	I. Castro	Damage induced in interconnect structures mimicking stresses during flip chip packaging
P20	K. Meier	Mechanical solder characterization under high strain rate condition
P21	I. Panchenko	Microstructure characterization of lead-free solders depending on alloy composition
P22	M. Roellig	Time and temperature dependent micromechanical properties of solder joints for 3D integration
P23	C. Okoro	Elimination of the axial deformation problem of Cu TSV in 3D integration
P24	M. Sebastiani	A new methodology for in-situ residual stress measurement in MEMS structures
P25	C. Sander	Adhesion analysis on thin film structures for CMOS technology using a modified double cantilever beam (DCB) technique
P26	G. Wielgoszewski	Investigation of copper interconnects using a scanning thermal microscope equipped with a novel thermal probe
P27	L. W. Kong	Sub-imaging techniques for 3D interconnect on bonded wafer pair
P28	T. Holz	Sub-mm depth resolved lattice constant measurements by using a modified Twin Mirror Arrangement (TMA) equipped with Cu-K α and Ag-K α parallel beam optics
P29	S. Kleindiek	Kleindiek nanotools for fine scale mechanical characterization
P30	J. Molina	Nanostructuring in ultra-thin HfO ₂ layers for high-k/III-V device application

P31	P. Guttman	X-ray microscopy as a tool for materials science applications: status and perspectives
P32	D. Vogel	fibDAC Stress Relief – a Novel Stress Measurement Approach for BEoL Structures
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Conference Location

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