2001 Technical Program

Reference Information

Proceedings of the International Workshop on Gate Insulators 2001, November 1-2, 2001

Session 1 – High-K Gate Dielectrics - I

No.	Title	Authors
1.1 ***Invited***	Integration challenges for high-k gate stack engineering	Howard R. Huff, A. Agarwal, L. Perrymore, C. Sparks, M. Freiler, G. Gebara, B. Bowers, P. J. Chen, P. Lysaght, J. Barnett, D. Riley, B. Nguyen, Y. Kim, J.E. Lim, S. Lim, G. Bersuker, P. Zeitzoff, G.A. Brown, C. Young, B. Foran, F. Shaapur, A. Hou, C. Lim, H. Alshareef , S. Borthakur, D. J. Derro, R. Bergmann, L. A. Larson, M. I. Gardner, J. Gutt, R. W. Murto, K. Torres and M. D. Jackson (International SEMATECH, Inc.)
1.2	Low Weibull slope of breakdown distributions in high-k layers	Thomas Kauerauf, Robin Degraeve, Charlotte Soens, Guido Groeseneken (IMEC), Eduard Cartier (IBM/IMEC)
1.3	A localized molecular orbital model for the electronic structure of transition metal silicate and alumina alloys	G Lucovsky, Y Zhang, G Appel, GB Rayner, H Ade and JL Whitten (N.C. State University)

Poster Session I: High K

No.	Title	Authors
P-1	An empirical approach for interpretation of chemical shifts in XPS/AES features in non-crystalline high-k transition metal silicate and aluminate alloys	G.B. Rayner Jr., K. Mai, M. Schultz, D. Hong and G. Lucovsky (N.C. State University)
P-2	Properties of zirconium silicate thin films with high zirconium concentrations	K.Torii, M.Hiratani, and T. Onai (Central Research Laboratory, Hitachi Ltd.)
P-3	Spectroscopic studies of bulk and interface electronic structure of Ta2O5-Al2O3 Alloys for Gate Dielectric Applications	M. Ulrich, R. Johnson, J.G. Hong, J. Rowe and G. Lucovsky (N.C. State University)
P-4	Kinetics of silicon consumption during CVD of ultra-thin high-k's on silicon	G. N. Parsons, D. Niu, and R. W. Ashcraft (N.C. State University)
P-5	Inelastic electron tunneling spectroscopy study of ultra-thin HfO2	Wei He, T.Tamagawa*, Why-Kei Lye**, Tso-Ping Ma, and Richard C. Barker (Yale University)
P-6	Effect of UV oxygen annealing on the properties of Ta2O5 films formed by UV assisted, liquid injection source, CVD	BJ O'Sullivan, PK Hurley (MNRC), J-Y Zhang, Q Fang, IW Boyd (University College London), MA Audier, JP Senateur (INPG), T Leedham (Inorgtech Ltd), and B Semmache (J.I.P. Elec.)

Session 2 – Traps, Defects & ESR

No.	Title	Authors
2.2	Proton-induced defect generation at the Si-SiO2 interface	S. N. Rashkeev, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides (Vanderbilt University)
2.3	A mechanism for spontaneous proton generation at the Si-SiO2 interface	A. H. Edwards, H. P. Hjalmarson, and P. A. Schultz (Sandia National Labs)
2.4	The role of hydrogen in hole trap generation in oxides and oxynitrides	J.F.Zhang, H.K.Sii, A.H.Chen, C.Z.Zhao (Liverpool John Moores University), M.J.Uren (DERA), G.Groeseneken and R.Degraeve (IMEC)

Poster Session II: Traps, Defects & ESR

No.	Title	Authors
P-7	Properties of electron traps generated in the gate oxide	W.D. Zhang, J.F. Zhang, M. Lalor, D. Burton (Liverpool John Moores University), G. Groeseneken, and R. Degraeve (IMEC)
P-8	Annealing induced degradation of thermal SiO2 on (100)Si: atomic assessment by electron spin resonance	A. Stesmans, B. Nouwen, D. Pierreux, and V. V. Afanas'ev (University of Leuven)
P-9	Paramagnetic interface defects in HfO2 and Al2O3 films on silicon	G.J. Gerardi (William Paterson University of New Jersey), D. Neumayer, J.H. Stathis, E.P. Gusev, N.A. Bojarczuk, and S. Guha (IBM)

Session 3 – Traditional Insulators

No.	Title	Authors
3.1 ***Invited***	Impact of oxide breakdown on FET and circuit operation and reliability	B. Kaczer, R. Degraeve, A. De Keersgieter, K. Van de Mieroop, M. Rasras, V. Simons, P. J. Roussel, and G. Groeseneken (IMEC, Kapeldreef)
3.2	Interaction of electrons with defects created by hot holes in ultra-thin silicon dioxide	E. M. Vogel, D. Heh, B. Wang, C. E. Weintraub, J. S. Suehle, M. D. Edelstein, and J. B. Bernstein (National Institute of Standards and Technology)

Poster Session III: Wide Bandgap & Remaining High K

No.	Title	Authors
P-10	Metal-Oxide-Semiconductor structures in inductively coupled plasma etch damaged 6H- and 4H- SiC	S.-M. Koo, S.-K. Lee, C.-M. Zetterling, and M. Östling (KTH Royal Institute of Technology)
P-11	Improving the 4H-SiC:SiO2 interface using N2O	L.A. Lipkin, M.K. Das and J.W. Palmour (Cree, Inc.)
P-12	GaP MIS capacitors with JVD SiN as the gate insulator	A. Chen, J. Woodall, X.W. Wang (Yale University)
P-13	High mobility HfO2 n- and p- channel transistors	F. Chen, S. A. Campbell, T. Z. Ma, R. Smith, and W. L. Gladfelter (University of Minnesota)
P-14	Ultra-thin hafnium silicate films with TaN and polysilicon gates for gate dielectric application	S. Gopalan, E. Dharmarajan, K. Onishi, R. Nieh, C. S. Kang, R. Choi, H-J. Cho, and J. C. Lee (University of Texas at Austin)
P-15	Ultrathin Al2O3 gate dielectrics with built-in interfacial silicon oxide	Y. Shimamoto, K. Obata, S. Saito, K. Torii, and M. Hiratani (Hitachi Ltd.)

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Session 4 – Thin Oxides - Radiation Effects

No.	Title	Authors	Notes
4.1 ***Invited***	Characterization of post-soft breakdown conduction in ultra-thin oxides induced by ionizing radiation and constant voltage stress	John S. Suehle (NIST)	
4.2	Wear-out and breakdown of ultra-thin oxides after exposure to ionizing radiation	A. Cester, L. Bandiera, A. Paccagnella, G. Ghibaudo, and G. Ghidini (Università di Padova)	

Poster Session IV: Traditional Insulators

No.	Title	Authors	Notes
P-16	Density gradient in SiO_2 films on silicon as revealed by positron annihilation spectroscopy	A. G. Revesz (Revesz Associates), W. Anwand, and G. Brauer (Forschungszentrum Rossendorf), H. L. Hughes, and W. Skorupa (NRL)	
P17	Interface structures generated by negative-bias temperature instability in Si/SiO_2 and Si/SiO_xN_y interfaces	J. Ushio, K. Kushida-Abdelghafar, and T. Maruizumi (Advanced Research Laboratory, Hitachi, Ltd.)	
P-19	Investigation of distribution of boron and fluorine at the polySi-SiO_2 and polySi-Si_3N_4 interfaces	S. Gupta (PolarFab)	accepted in Journal of Electrochemical Society
P-20	Border trap characterization in ultra-thin JVD nitride capacitors	K.N. ManjulaRani, V. Ramgopal Rao and J. Vasi (Indian Institute of Technology)	
P-21	Extraction of effective mass of carriers in Si_3N_4 by accurate modeling of gate tunneling current	Deleep R. Nair, Mahesh B. Patil, J. Vasi (Indian Institute of Technology)	

Session 5 –SiC / Wide Bandgap

No.	Title	Authors	Notes
5.1 ***Invited***	The 4H-SiC/SiO_2 interface	J. K. McDonald, A. Franceschetti, S.T. Pantelides, R.A. Weller and L.C. Feldman (Vanderbilt University) G. Chung, C.C. Tin and J.R. Williams (Auburn University), C.-Y. Lu, B.S. Um and J.A.Cooper, Jr. (Purdue) and M.K. Das (Cree Inc)	
5.2	Interfacial oxide traps in n-type 4H- and 6H-SiC MOS structures	H.Ö. Ólafsson, E.Ö. Sveinbjörnsson, T.E. Rudenko, V.I. Kilchytska, I.P. Tyagulski, and I.N. Osiyuk (Microtechnology Centre at Chalmers)	
5.3	Using the Hall effect to measure interface trap densities in silicon and SiC MOS devices	N. S. Saks, M.G. Ancona, and R.W. Rendell (Naval Research Laboratory)	
5.4	Effect of an interfacial nitride layer on SiO_2/4H-SiC interface	X.W. Wang, H.M. Bu, T.P. Ma and X.W. Wang (Yale University), B.L. Laube (United Technologies Research Center), C. Caragianis-Broadbridge (Southern Connecticut State University)	

Session 6 – High K with Hf

No.	Title	Authors	Notes
6.1 ***Invited***	Comparative study of high-k CVD films of Hf and Zr Silicate for CMOS devices	M.J. Bevan, M.R. Visokay, J.J. Chambers, A.L.P. Rotondaro, H. Bu, A. Shanware, D.E. Mercer, R.T.Laaksonen, L. Colombo (Texas Instruments Incorporated)	
6.2	Thermal stability of hafnium oxide and hafnium aluminum oxide	W. Zhu and T.P. Ma (Yale University)	
6.3	Thermal stability of high-k gate dielectrics on Si: Studies of metal incorporation from silicates into Silicon	M. Quevedo-Lopez, M. El-Bouanani, S. Addepalli, J. L. Duggan, B. E. Gnade, R. M. Wallace (University of North Texas) M.R.Visokay, M.Douglas, M.J.Bevan, A.Rotondaro and L. Colombo (Texas Instruments Incorporated)	
6.4	Semi-empirical correlation of equivalent oxide thickness C-V extraction routines	K. Ahmed, P. Kraus, C. Olsen, F. Nouri, and G. Miner (Applied Materials, Inc.)	

Session 7 – High-K Gate Dielectrics - II

No.	Title	Authors	Notes
7.1 ***Invited***	High K gate dielectric university research	John R. Hauser (N.C. State University)	
7.2	Hole trapping in thin ALCVD layers of Al_2O_3, ZrO_2 on (100)Si	V. V. Afanas'ev and A. Stesmans (University of Leuven)	
7.3	Properties of high k / ultra pure Si_3N_4 / Si stacks	M. Shriver, A. Gabrys, X. Shi, S. A. Campbell, and T. K. Higman (University of Minnesota)	
7.4	An investigation into the electrical properties of ultra-thin zirconia dielectrics	S. Ramanathan, P. McIntyre (Stanford University), G.D. Wilk and D.A. Muller (Agere)	

Session 8 – High K with Rare Earth, Al

No.	Title	Authors	Notes
8.1	Interface reactions of high-k Y_2O_3 gate oxides with Si	B.W. Busch, J. Kwo, M. Hong, J.P. Mannaerts, B.J. Sapjeta (Agere Systems), W.H. Schulte, E. Garfunkel, and T. Gustafsson (Rutgers University)	
8.2	High-k gate dielectrics of single crystalline Rare-Earth metal oxides directly grown on Si(111)	Y. Nishikawa, N. Fukushima and N. Yasuda (Toshiba Corporation)	
8.3	Charging effects on the effective mobility of high-k dielectric based metal-oxide-semiconductor field-effect transistors	L.-Å. Ragnarsson, N. A. Bojarczuk, S. Guha, E. Gusev, J. M. Karasinski (IBM)	
8.4	Ultra-thin titanium aluminates with improved thermal stability for CMOS gate application	Z. J. Luo, T. P. Ma, H. H. Tseng, J. Conner, T. Tamagawa (Yale University)	
8.5	Measurement of barrier heights in high permittivity gate dielectric films	S. Zafar, E. Cartier and E. P. Gusev (IBM)	