

## TABLE OF CONTENTS

### Plasma Enhanced Chemical Vapor Deposition

Low Temperature, Permanent Magnet Electron Cyclotron Resonance Plasma Deposition of Thermally Stable Amorphous Silicon and Silicon Nitride .....	1
<i>C. Doughty, Q. Zhai, and M. Lantigua</i>	
The Integration of PECVD BPSG Films as a Pre-Metal Dielectric .....	13
<i>G. Albrecht and W. King</i>	
Wet Etching Studies on Electron Cyclotron Resonance (ECR) Plasma Enhanced Chemical Vapor Deposited Silicon Nitride Films .....	34
<i>K.B. Sundaram, R.E. Sah, and K. Balachandran</i>	
Characterization of n+ uc-Si:H for TFTs Fabricated at 120 C on Plastic Substrates .....	42
<i>T. Charania, B. Park, A. Sazanov, D. Striakhilev, and A. Nathan</i>	
Gas Phase Analysis of TiC and TiN Plasma Enhanced CVD Processes by Molecular Beam Mass Spectrometry .....	48
<i>C.C. Amato-Wierda, and C.M. Reddy</i>	
All Dry CVD-Based Resist for Advanced Lithography Processes .....	58
<i>C. Monget, O. Joubert, L. Vallier, and T.W. Weidman</i>	
Modeling of Ionized Physical Vapor Deposition of Copper .....	72
<i>M.O. Bloomfield, D.F. Richards, and T.S. Cale</i>	
Encroachment on Silicon Substrate by PECVD Deposited Tungsten at Low Temperatures and the Effect of WF5 on Selectivity .....	80
<i>M.F. Bain, B.M. Armstrong, and H.S. Gamble</i>	

### Measurements and Diagnostics

Time Resolved In-situ Ellipsometry Study of Plasma Assisted Nitridation of Zirconia Thin Films in N <sub>2</sub> -H <sub>2</sub> Atmosphere .....	90
<i>L. Pichon, S. Camelio, M. Drouet, T. Girardeau, F. Lignou, and A. Straboni</i>	

Wafer Edge and Interferometry Limitations in Low Open Area Etch  
Endpoint Detection using Optical Emission Spectroscopy ..... 100  
*B.E. Goodlin, D.S. Boning, H.H. Sawin, and M. Yang*

A method of In-situ Monitoring Oxide/Nitride Etch Selectivity ..... 124  
*S. Fang, A. Gutmann, and B. Flietner*

Control of Plasma Chemistry in an Ar/c-C<sub>4</sub>F<sub>8</sub> Inductively Coupled  
Discharge ..... 129  
*S. Rauf, P.L.G. Ventzek, and V. Arunachalam*

### **Modeling and Plasma Damage**

Feature Profile Evolution using Level Set Methods ..... 140  
*H.H. Hwang*

Modeling of Aspect Ratio Dependent Etching ..... 153  
*M.O. Bloomfield, D.F. Richards, and T.S. Cale*

Experimental Study of Geometry Structure Dependent Charging of  
the Dielectric Surface during Plasma Etching ..... 160  
*M.K. Abatchev, B.J. Howard, K.G. Donohoe, and G.T. Blalock*

Plasma Induced Damage of High Density Plasma FSG in 0.18 μm  
Technology Node ..... 168  
*T.C. Ang, M.G.L. Tay, P.I. Ong, W.B. Loh, and S.Y. Loong*

Hydrogen Induced Polarization Degradation of SrBi<sub>2</sub>Ta<sub>2</sub>O<sub>9</sub> Thin Film  
Capacitors in Plasma Etching ..... 173  
*O-S. Kwon, Y-S. Seol, J-W. Kim, and J-M. Hwang*

### **Silicon Etching**

Effect of First Wafer on the CD Bias in DARC/Poly Gate Structure ..... 183  
*L. Chen, M. Singh, N-H. Kim, C. Chu, and J. Chinn*

Study of STI Etching Defects for 0.18 μm and beyond Technology ..... 198  
*J. Xia and M. Yang*

300 mm Wafer Polysilicon Etch Process and Tool Improvements ..... 205  
*J. Petrucci, T. Morgenstern, and K. Mautz*

Very High Aspect Ratio Deep Trench Structures for Sub-0.13 $\mu\text{m}$ DRAMs .....	217
<i>R. Ranade and G.S. Mathad</i>	
Comparison of Etching Plasmas for Deep Trench Silicon Etch Process .....	223
<i>R. Ranade and G.S. Mathad</i>	
A Novel Self Cleaning Process for High Aspect Ratio Silicon Etch .....	230
<i>A.H. Khan, A. Kumar, J. Chinn, and D. Podlesnik</i>	
Process Stability Control in Silicon Etching with High Density Plasma .....	239
<i>S. Xu, J. Chinn, and D. Podlesnik</i>	
Surface Adsorption and Reaction of Chlorine on Impurity-Doped Si Using an ECR Plasma .....	251
<i>T. Kanetsuna, T. Matsuura, and J. Murota</i>	
Reduction of Si Loss and CD Control in HDP Dielectric Etch Systems .....	257
<i>N-H. Kim</i>	

### **Dielectric Etching**

300 mm Wafer Dielectric Oxide Etch Process and Tool Improvements .....	267
<i>A. Poschenrieder and K. Mautz</i>	
Etching of Vias and Trenches through Low-k Dielectrics with Feature Sizes down to 0.1 $\mu\text{m}$ Using MORI High Density Plasmas .....	279
<i>D.J. Thomas, Y.P. Song, K. Powell, C. Fragos, and A. Watson</i>	
Oxide Etching in Inductively Coupled Fluorocarbon Plasmas .....	289
<i>M. Schaepkens and G.S. Oehrlein</i>	
Etch Stop Phenomena in DPS High Density Etcher .....	316
<i>M. Yang and T. Ambrose</i>	
A Highly Manufacturable Spacer Profile Solution for Void-Free Pre- Metal Dielectrics Gap-Fill in Sub-0.25 Micron Technology .....	325
<i>J. Yu, V.Y. Vassiliev, Y.R. Pradeep, A. Cuthbertson, A. Jain, and G. Zou</i>	
Development of a High Flow PET Process in HDP Dielectric Etch Systems .....	335
<i>N-H. Kim</i>	

## **Metal Etching**

300 mm Wafer Metal Etch and Ash Process Characterization for Improved Performance .....	349
<i>R. McGowan, L. Paschedag, U. Baier, and K. Mautz</i>	
Process Study of a New Copper Dry Etching Method – The HCl Chemistry .....	361
<i>S. Lee and Y. Kuo</i>	
Etching Temperature and Via Resistance .....	368
<i>M. Yang, J. Zuang, A. Zhou, and L. Li</i>	
Patterning of Aluminum Nitride Films with SiO <sub>2</sub> Hard Mask in an MERIE Diode Reactor .....	374
<i>M. Engelhardt, S. Marksteiner, and L. Elbrecht</i>	
AUTHOR INDEX .....	387
SUBJECT INDEX .....	390