1. Record Nr. UNICAMPANIAVAN0277881

Titolo	Mathematical Modeling of the Human Brain : From Magnetic Resonance Images to Finite Element Simulation / Kent-André Mardal ... [et al.]
Pubbl/distr/stampa	Cham, : Springer, 2022
Descrizione fisica	xvi, 118 p. : ill. ; 24 cm
Soggetti	65M60 - Finite element, Rayleigh-Ritz and Galerkin methods for initial value and initial-boundary value problems involving PDEs [MSC 2020] 92-XX - Biology and other natural sciences [MSC 2020] 92B20 - Neural networks for/in biological studies, artificial life and related topics [MSC 2020] 92C55 - Biomedical imaging and signal processing [MSC 2020]
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia

2. Record Nr. UNINA9911019406703321

Autore	Steigerwald Joseph M
Titolo	Chemical mechanical planarization of microelectronic materials / / Joseph M. Steigerwald, Shyam P. Murarka, Ronald J. Gutmann
Pubbl/distr/stampa	Weinheim, : Wiley-VCH, 2004
ISBN	9786611843144 9781281843142 1281843148 9783527617746 3527617744 9783527617753 3527617752
Descrizione fisica	1 online resource (339 p.)
Altri autori (Persone)	MurarkaS. P GutmannRonald J
Disciplina	621.3815 621.38152
Soggetti	Microelectronics - Materials Grinding and polishing

Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Chemical Mechanical Planarization of Microelectronic Materials; CONTENTS; Preface; 1 Chemical Mechanical Planarization - An Introduction; 1.1 Introduction; 1.2 Applications; 1.3 The CMP Process; 1.4 CMP Tools; 1.5 Process Integration; 1.6 Conclusion and Book Outline; References; 2 Historical Motivations for CMP; 2.1 Advanced Metallization Schemes; 2.1.1 Interconnect Delay Impact on Performance; 2.1.2 Methods of Reducing Interconnect Delay; 2.1.3 Planarity Requirements for Multilevel Metallization; 2.2 Planarization Schemes; 2.2.1 Smoothing and Local Planarization; 2.2.2 Global Planarization 2.3 CMP Planarization2.3.1 Advantages of CMP; 2.3.2 Disadvantages of CMP; 2.3.3 The Challenge of CMP; References; 3 CMP Variables and Manipulations; 3.1 Output Variables; 3.2 Input Variables; References; 4 Mechanical and Electrochemical Concepts for CMP; 4.1 Preston Equation; 4.2 Fluid Layer Interactions; 4.3 Boundary Layer Interactions; 4.3.1 Fluid Boundary Layer; 4.3.2 Double Layer; 4.3.3 Metal Surface Films; 4.3.4 Mechanical Abrasion; 4.4 Abrasion Modes; 4.4.1 Polishing vs. Grinding; 4.4.2 Hertzian Indentation vs. Fluid-Based Wear; 4.5 The Polishing Pad; 4.5.1 Pad Materials and Properties 4.5.2 Pad Conditioning4.6 Electrochemical Phenomena; 4.6.1 Reduction-Oxidation Reactions; 4.6.2 Pourbaix Diagrams; 4.6.3 Mixed Potential Theory; 4.6.4 Example: Copper CMP in NH3-Based Slurries; 4.6.5 Example: Copper-Titanium Interaction; 4.7 Role of Chemistry in CMP; 4.8 Abrasives; References; 5 Oxide CMP Processes - Mechanisms and Models; 5.1 The Role of Chemistry in Oxide Polishing; 5.1.1 Glass Polishing Mechanisms; 5.1.2 The Role of Water in Oxide Polishing; 5.1.3 Chemical Interactions Between Abrasive and Oxide Surface; 5.2 Oxide CMP in Practice; 5.2.1 Polish Rate Results 5.2.2 Planarization Results5.2.3 CMP in Manufacturing; 5.2.4 Yield Issues; 5.3 Summary; References; 6 Tungsten and CMP Processes; 6.1 Inlaid Metal Patterning; 6.1.1 RIE Etch Back; 6.1.2 Metal CMP; 6.2 Tungsten CMP; 6.2.1 Surface Passivation Model for Tungsten CMP; 6.2.2 Tungsten CMP Processes; 6.3 Summary; References; 7 Copper CMP; 7.1 Proposed Model for Copper CMP; 7.2 Surface Layer Formation - Planarization; 7.2.1 Formation of Native Surface Films; 7.2.2 Formation of Nonnative Cu-BTA Surface Film; 7.3 Material Dissolution; 7.3.1 Removal of Abraded Material 7.3.2 Increasing Solubility with Complexing Agent7.3.3 Increasing Dissolution Rate with Oxidizing Agents; 7.3.4 Chemical Aspect of the Copper CMP Model; 7.4 Preston Equation; 7.4.1 Preston Coefficient; 7.4.2 Polish Rates; 7.4.3 Comparison of Kp Values; 7.5 Polish-Induced Stress; 7.6 Pattern Geometry Effects; 7.6.1 Dishing and Erosion in Cu/SiO2 System; 7.6.2 Optimization of Process to Minimize Dishing and Erosion; 7.6.3 Summary; References; 8 CMP of Other Materials and New CMP Applications; 8.1 The Front-End Applications in Silicon IC Fabrication 8.1.1 Polysilicon CMP for Deep Trench Capacitor Fabrication
Sommario/riassunto	Chemical Mechanical Planarization (CMP) plays an important role in today's microelectronics industry. With its ability to achieve global planarization, its universality (material insensitivity), its applicability to multimaterial surfaces, and its relative cost-effectiveness, CMP is the

ideal planarizing medium for the interlayered dielectrics and metal films used in silicon integrated circuit fabrication. But although the past decade has seen unprecedented research and development into CMP, there has been no single-source reference to this rapidly emerging technology-until now.Chemica