

Electronic Thin Film Reliability

Thin Film Materials, Processes, and Reliability
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The Mechanics and Reliability of Films, Multilayers and Coatings
Proceedings of the International Symposium on Thin Film Materials, Processes, Reliability, and Applications, Thin Film Processes
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Review of the Electrical Communication Laboratories
G. S. Mathad King-Ning Tu G. S. Mathad Matthew R. Begley G. S. Mathad Electrochemical Society. Meeting Choong-Un Kim Charles Ume United States. National Aeronautics and Space Administration. Office of Reliability and Quality Assurance
Radoslav Rusanov Meng Zhang, Mingxiang Wang L. Holland () Milton Ohring Hari Singh Nalwa JS. Suehle Denki Tsushin Kenkyujo (Japan)

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the symposium covered three topics i plasma processing for

thin films are widely used in the electronic device industry as the trend for miniaturization of electronic devices moves into the nanoscale domain the reliability of thin films becomes an increasing concern building on the author s previous book electronic thin film science by tu mayer and feldman and based on a graduate course at ucla given by the author this new book focuses on reliability science and the processing of thin films early chapters address fundamental topics in thin film processes and reliability including deposition surface energy and atomic diffusion before moving onto systematically explain irreversible processes in interconnect and packaging technologies describing electromigration thermomigration and stress migration with a closing chapter dedicated to failure analysis the reader will come away with a complete theoretical and practical understanding of electronic thin film reliability kept mathematically simple with real world examples this book is ideal for graduate students researchers and practitioners

a comprehensive treatment of the mechanics of multilayers and its implications for reliability with easy to use software to compute key results

thin film transistor reliability provides a comprehensive analysis of the reliability challenges in thin film transistors tfts essential components in modern electronics covering topics from fundamental structures to degradation mechanisms this book equips researchers and engineers with the tools to assess analyze and improve tft reliability the book systematically explores key reliability concerns including performance characterization defect states voltage stress effects circuit level degradation and environmental influences advanced reliability analysis methods and practical improvement strategies are also discussed offering insights into future developments key features in depth discussion of tft degradation mechanisms and reliability concerns comprehensive analysis techniques including transfer curve and noise analysis effects of dc ac voltage stress self heating and environmental factors strategies for enhancing tft reliability through structural modifications

this is the first book that can be considered a textbook on thin film science complete with exercises at the end of each chapter ohring has contributed many highly regarded reference

books to the ap list including reliability and failure of electronic materials and the engineering science of thin films the knowledge base is intended for science and engineering students in advanced undergraduate or first year graduate level courses on thin films and scientists and engineers who are entering or require an overview of the field since 1992 when the book was first published the field of thin films has expanded tremendously especially with regard to technological applications the second edition will bring the book up to date with regard to these advances most chapters have been greatly updated and several new chapters have been added

the reliability of gate oxides is becoming a critical concern as oxide thickness is scaled below 4 nm in future technology the breakdown detection algorithms in traditional reliability characterization techniques must be modified for sub 4 nm thick sio₂ films that exhibit excessive tunneling currents and soft breakdown it becomes essential to fully understand the physical mechanism s responsible for gate oxide wear out and breakdown if reliability projections are based on the results of highly accelerated wafer level goi tests issues relating to the reliability testing of ultra thin oxides are discussed with examples

consists of abstracts of various of the laboratory s journals

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