

# X Ray Metrology In Semiconductor Manufacturing

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X-Ray Metrology in Semiconductor Manufacturing X-Ray Metrology in Semiconductor Manufacturing Microlithography and Metrology in Micromachining Proceedings of Symposium M on Optical and X-ray Metrology for Advanced Device Materials Characterization Integrated Circuit Metrology, Inspection, and Process Control V Current Trends in Optical and X-ray Metrology of Advanced Materials for Nanoscale Devices III Integrated Circuit Metrology, Inspection, and Process Control Proceedings of Symposium M on Optical and X-Ray Metrology for Advanced Device Materials Characterization, of the E-MRS 2003 Spring Conference INIS Atomindex Meeting Abstracts Semiconductor International Government Reports Annual Index Government Reports Index U.S. Government Research and Development Reports Index Nondestructive Evaluation for Process Control in Manufacturing Bibliography of Scientific and Industrial Reports International Aerospace Abstracts Thomas Register of American Manufacturers Radioisotope Gauges for Industrial Process Measurements Materials Evaluation *D. Keith Bowen D. Keith Bowen D. Chateigner William H. Arnold Daniel Chateigner Electrochemical Society. Meeting R. H. Bossi Geir Anton Johansen*

the scales involved in modern semiconductor manufacturing and microelectronics continue to plunge downward effective and accurate characterization of materials with thicknesses below a few nanometers can be achieved using x rays while many books are available on the theory behind x ray metrology xrm x ray metrology in semiconductor manufacturing is the first book to focus on the practical aspects of the technology and its application in device fabrication and solving new materials problems following a general overview of the field the first section of the book is organized by application and outlines the techniques that are best suited to each the next section delves into the

techniques and theory behind the applications such as specular x ray reflectivity diffraction imaging and defect mapping finally the third section provides technological details of each technique answering questions commonly encountered in practice the authors supply real examples from the semiconductor and magnetic recording industries as well as more than 150 clearly drawn figures to illustrate the discussion they also summarize the principles and key information about each method with inset boxes found throughout the text written by world leaders in the field x ray metrology in semiconductor manufacturing provides real solutions with a focus on accuracy repeatability and throughput

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