

Table of Contents

Preface

Today's Mainstream Microelectronics - A Result of Technological, Market and Human Enterprise

H.G. Grimmeiss and E. Kasper 1

Future Material Systems: Requirements and Applications

E. Kasper, H.J. Müssig and H.G. Grimmeiss 17

Silicon Based Heterostructures: Advances in Channel Materials

E. Kasper 27

The Influence of Defects and Impurities on Electrical Properties of High-k Dielectrics

J. Dąbrowski, S. Miyazaki, S. Inumiya, G. Kozłowski, G. Lippert, G. Łupina, Y. Nara, H.J. Müssig, A. Ohta and Y. Pei 55

Materials and Processes for Non-Volatile Memories

R. Bez, E. Camerlenghi and A. Pirovano 111

Nanoelectronics and Nanospintronics: Fundamentals and Materials Perspective

K.L. Wang and I.V. Ovchinnikov 133

Organic Materials for Large Area Electronics

R. Friend 159

Photovoltaic Power Generation: The Impact of Nano-Materials

A.R. Peaker and V.P. Markevich 181