

# Silicon-on-Insulator: Its Technology and Applications

Edited by S. Furukawa

UNIVERSITÄTSBIBLIOTHEK  
HANNOVER  
TECHNISCHE  
INFORMATIONSBIBLIOTHEK



KTK Scientific Publishers / Tokyo

D. Reidel Publishing Company / Dordrecht, Boston, London



A MEMBER OF THE  
KLUWER ACADEMIC PUBLISHERS GROUP

RO 3062  
(1)

## CONTENTS

Preface .....	S. FURUKAWA	v
<b>CHAPTER 1: LASER AND ELECTRON-BEAM RECRYSTALLIZATION</b>		
Growth Mechanisms and Defects in Si Layers Grown on SiO <sub>2</sub> by Bridging (Lateral Seeded) Epitaxy .....	T. TOKUYAMA, M. TAMURA, N. NATSUAKI, M. OHKURA, M. ICHIKAWA, and M. MIYAO	3
Laser Crystallization of Polycrystalline Silicon by Controlling Lateral Thermal Profile .....	T. NISHIMURA, Y. AKASAKA, H. NAKATA, K. SUGAHARA, and T. ISU	21
Electron Beam Recrystallized SOI Structures .....	K. SHIBATA, T. INOUE, K. KATO, and M. KASHIWAGI	29
Recrystallization of SOI Structures by Split Laser Beam ..	N. AIZAKI	41
Nucleation and Crystal Growth Characteristics in Energy Beam Crystallization of Silicon Islands .....	K. KUGIMIYA, S. AKIYAMA, and N. YOSHII	47
Recrystallization of Silicon on Insulator with a Heat-Sink Structure ..	S. KAWAMURA, N. SASAKI, T. IWAI, M. NAKANO, and M. TAKAGI	67
Recrystallization of Polycrystalline Si over SiO <sub>2</sub> through Strip Electron-Beam Irradiation .....	Y. HAYAFUJI, T. YANADA, S. USUI, S. KAWADO, A. SHIBATA, N. WATANABE, M. KIKUCHI, H. HAYASHI, and K. E. WILLIAMS	85
<b>CHAPTER 2: ZONE MELTING RECRYSTALLIZATION</b>		
Zone-Melting Recrystallization of Si Films on SiO <sub>2</sub> .....	B-Y. TSAUR	101
Optically-Heated Zone Crystal Growth of Silicon Thin Films on Amorphous Substrates .....	D. K. BIEGELSEN, W. G. HAWKINS, L. E. FENNELL, N. M. JOHNSON, and M. D. MOYER	129
Recrystallization of Polycrystalline Silicon on Fused Silica Using an RF-Heated Carbon Susceptor .....	Y. KOBAYASHI, A. FUKAMI, and T. SUZUKI	137
Strip Heater Recrystallized SOI Structures .....	K. HIGUCHI, S. SAITO, and H. OKABAYASHI	151
Single Crystal Germanium Island Formation on Insulator by Zone Melting ....	M. TAKAI, T. TANIGAWA, K. GAMO, and S. NAMBA	159

CHAPTER 3: SOLID PHASE EPITAXY		
Modeling of Interface Atomic Arrangement for Analysis of Solid Phase Epitaxy and Si-on-Insulator Structure .....	T. SAITO and I. OHDOMARI	171
Lateral Solid Phase Epitaxy of Evaporated Amorphous Si Films onto SiO <sub>2</sub> Patterns.....	H. YAMAMOTO, H. ISHIWARA, S. FURUKAWA, M. TAMURA, and T. TOKUYAMA	187
Formation of a Silicon-on-Insulator Structure by Solid-Phase Epitaxy .....	Y. KUNII, M. TABE, and K. KAJIYAMA	209
Characterization of Solid Phase Epitaxially Grown Si Films on SiO <sub>2</sub> .	M. TAMURA, M. MIYAO, T. TOKUYAMA, H. YAMAMOTO, H. ISHIWARA, and S. FURUKAWA	231
CHAPTER 4: CHARACTERIZATION AND DEVICE APPLICATIONS		
Microstructural Characterization of Silicon-on-Insulator Structures ..	R. F. PINIZZOTTO	251
High Speed SOI-CMOS Devices by Laser Recrystallization Technique .....	T. NISHIMURA, Y. AKASAKA, and H. NAKATA	263
Characterization of SOI Double Si Active Layers through Fabrication of Elementary Devices .....	M. MIYAO, M. OHKURA, and T. TOKUYAMA	269
Device Application of SIMOX (Separation by IMplanted OXYgen) Structure.....	K. KAJIYAMA, K. IZUMI, and S. NAKASHIMA	283
Author Index.....		295