

TABLE OF CONTENTS

	Page No
Preface	vi
PART I	
SOI MATERIALS AND PHYSICAL PROCESSES	
Variants on Bonded SOI for Advanced ICs	1
H.S. Gamble (Invited)	
Ion Beam Synthesis of SiC on Insulator Structures	13
Ch. Serre, A. Pérez-Rodríguez, A. Romano-Rodríguez, J.R. Morante, J. Esteve, M.C. Acero, D. Panknin, R. Kögler, W. Skorupa	
Recent Advances in SOS Materials and Devices	19
T. Morishita, Y. Moriyasu, M. Matsui, A. Yasujima (Invited)	
Relaxed SiGe On Insulator Fabricated via Wafer Bonding and Layer Transfer: Etch-back and Smart-cut Alternatives	27
G. Taraschi, Z.Y. Cheng, M.T. Currie, C.W. Leitz, T.A. Langdo, M.L. Lee, A. Pitera, E.A. Fitzgerald, J.L. Hoyt, D.A. Antoniadis	
Electrolytic Hydrogenation of Buried Preamorphized Layer in Silicon for SOI Wafer Process	33
A.Y. Usenko, W.N. Carr	
From SOI to SOIM technology: Application for Specific Semiconductor Processes	39
O. Rayssac, H. Moriceau, M. Olivier, I. Stoemenos, A.M. Cartier, B. Aspar	
Volume Production in ELTRAN® SOI-Epi Wafer™s	45
H. Isaji, J. Nakayama, T. Yonehara (Invited)	
Non-destructive Impulsive Stimulated Thermal Scattering (ISTS) Analysis of SOI defects in SIMOX	51
M.J. Anc, M. Gostein, M. Banet, L.P. Allen	
Detection of SOI Fatal Defects by Cu Decoration in Conjunction with HF Immersion	57
K. Notsu, N. Honma, T. Yonehara	
Analysis of Microstructural Properties of SIMOX Wafers with Photoluminescence	63
V. Higgs, M.J. Anc	
Defects and Strain in Hydrogen and Helium Co-implanted Silicon	69
X. Duo, W. Liu, M. Zhang, C. Lin, S.X. Wang, L.M. Wang	
Atomic-Layer Cleaving for SOI Wafer Fabrication	75
M.I. Current, I.J. Malik, M. Feurfanger, M. Korolik, S. Kang, H. Kirk, M. Fang, S.N. Farrens, F.J. Henley	

PART II

ELECTRICAL CHARACTERIZATION AND PROPERTIES

Electrical properties of Metal-Buried Oxide-Silicon Structures fabricated by Low Dose SIMOX process	79
P. Dimitrakis, G.J. Papaioannou, S. Cristoloveanu	
Extraction of the Oxide Charge Density at Front and Back Interfaces of SOI nMOSFETs Devices	85
A.S. Nicolett, J.A. Martino, E. Simoen, C. Claeys	
MOSFET Based "Gated-Diode" Characterization of the Buried Oxide Interface of Irradiated and non-Irradiated SIMOX and UNIBOND Wafers	91
A. Salman, D.E. Ioannou, R.K. Lawrence, W.C. Jenkins, S.T. Liu	
Measurements of Low Field Mobility in Ultra-Thin SOI n- and p-MOSFETs	97
M. Mastrapasqua, D. Esseni, G.K. Celler, F.H. Baumann, C. Fiegna, L. Selmi, E. Sangiorgi	
Electrical Characterization of Bonded SOI Layers with Hg-contact "Horseshoe" Probes and InGa-contact "H-FET" Structures	103
H. Kirk, S. Bedell, M. Current	
Determination of Silicon Film Doping Concentration and Back Interface Oxide Charge Density using SOI-MOS Capacitor	109
V. Sonnenberg, J.A. Martino	
Charge Injection Characterization of Thin-Film SOI MOS Transistors at High Temperature	115
G. Picún, L. Demeûs, D. Flandre	
Total Dose Radiation Response of 0.25 μm SOI PD CMOS Transistors	121
S.T. Liu, P.F. Fechner, W.C. Jenkins, T. Barge	
Cryogenic Operation of Fully-Depleted SOI nFETs	127
Y. Li, J.D. Cressler, G. Niu, J. Patel	
Evaluation and Comparison of Various Silicon-On-Sapphire (SOS) Materials using the Pseudo-MOSFET Technique	133
N. Hefyene, S. Cristoloveanu, G. Ghibaudo, M. Matsui, A. Yasujima	
Trapping and Annealing of Charge Generated by FN Electron Injection in Buried Oxide of SIMOX and UNIBOND SOI Structures	139
A.N. Nazarov, V.I. Kilchytska, I.P. Barchuk, A.T. Tkachenko	

PART III

DEVICE PHYSICS AND SIMULATION

Study of Self-Heating Influence on Device Performance of 0.1 μm SOI MOSFETs Including Velocity Overshoot	145
S. Kawanaka, K. Matsuzawa, K. Inoh, Y. Katsumata, M. Yoshimi, H. Ishiuchi	
Influence of the Back Gate Bias on the Properties of SOI LDMOSFETs	151
A. Vandooren, S. Cristoloveanu, M. Mojarradi, E. Kolawa	

Monte Carlo Simulation of Electron Transport in Silicon-On-Insulator devices	157
F. Gámiz, J.B. Roldán, J.A. López-Villanueva, P. Cartujo-Cassinello, J.E. Carceller, P. Cartujo	
	(Invited)
Hot-Carrier Effects in Deep Submicron SOI-MOSFETs during Off-state Operation: Aging Characteristics and Defect Evaluation	169
P. Dimitrakis, J. Jomaah, F. Balestra, G.J. Papaioannou	
Special Frequency-Dependent Transient Mechanisms in SOI MOSFETs Measured by a New Technique: The Average Transient Current	175
T. Ernst, S. Lakeou, F. Allibert, J. Pretet, S. Cristoloveanu	
A Simulation Study of Partially Depleted SOI MOSFETs	181
M. Gritsch, H. Kosina, T. Grasser, S. Selberherr	
A Compact Model for Silicon-On-Insulator LDMOST, Including Accumulation, Lateral Doping Gradient and High Side Behaviour	187
N. D'Halleweyn, J. Benson, M. Swanenberg, W. Redman-White	
A New Fully-Depleted SOI MOSFET Macro-Model Valid from DC to RF	193
B. Iñiguez, J.P. Raskin, L. Demeûs, A. Nève, M. Goffioul, P. Simon, D. Vanhoenacker, D. Flandre	
Analysis of Non-Stationary Transport and Quantum Effects in Realistic 0.1 µm Partially-Depleted SOI Technology	199
D. Munteanu, G. Le Carval, C. Fenouillet-Beranger	
Silicon-On-Insulator (SOI) MOSFET Structure for Sub-50 nm Channel Regime	205
Y. Omura	
Modeling, Simulation and Design Kit for SOI	211
O. Faynot, J.L. Pelloie, M. Belleville	
	(Invited)
Channel Width, Length and Thickness Effects in LOCOS-Isolated SOI MOSFETs	221
J. Pretet, S. Cristoloveanu, F. Allibert, A. Zaslavsky, C. Raynaud	
Theoretical Prediction of Switching in MOS/SOI Transistor with Ultrathin Oxide	227
B. Majkusiak	
Modeling of the Leakage Drain Current in Accumulation-Mode SOI pMOSFETs for High-Temperature Applications	233
M. Bellodi, B. Iñiguez, D. Flandre, J.A. Martino	
Suppression of the Floating Body Effect with SiGe Source Structure for Fully Depleted SOI MOSFET's	239
Y.G. Ko, H.S. Kang, B.S. Kim, Y.W. Kim, K.P. Suh	
Impact of Body-to-Body Leakage on MOSFET Design Scaling in Partially Depleted SOI	245
J.W. Sleight, A. Bryant, W. Clark, M. Jeong, E.J. Nowak, W. Rausch, M.J. Sherony	
Potential of Surface Accumulation Mode for Deep-Submicron Fully-Depleted SOI CMOS Technologies	251
B. Iñiguez, E. Raully, D. Flandre	

Observation of Bulk-Trap Induced Generation-Recombination Noise in the Fully Depleted SOI MOSFET	259
Z. Lun, D.S. Ang, C.H. Ling	

PART IV DEVICE, CIRCUITS AND APPLICATIONS

Silicon-On-Sapphire Technology: QUO VADIS II. A Competitive Alternative for RF Systems	265
I. Lagnado, P.R. de la Houssaye, S.J. Koester, R. Hammond, J.O. Chu, J.A. Ott, P.M. Mooney, L. Perraud, K.A. Jenkins	
Improvement of Sub-0.25 μm Fully-Depleted SOI CMOS Analog Performance by Thinning the Si Film	271
A. Nève, V. Dessard, P. Delatte, V. Brodeux, B. Iñiguez, E. Raully, D. Flandre	
Mixed-Signal LSI Technology using SOI Devices for Fingertip-Sized Communicator	277
Y. Kado, Y. Matsuya, T. Douseki, S. Nakata, M. Harada, J. Yamada	
	(Invited)
Characterization of Thin-Film SOI Split-Drain MOS Transistors as Magnetic Sensors	289
G. Picún, D. Flandre	
Reduction of Dynamic Leakage Current for 0.18 μm SOI Devices by Using Retrograded Channel Structure	295
H.S. Kang, B.S. Kim, J.H. Jin, Y.W. Kim, K.P. Suh	
Improved LOCOS Isolation for Ultra Thin 0.18 μm Fully-Depleted SOI CMOS	301
H. van Meer, K. De Meyer	
The BELPHI-SOI Technology	307
G. Amato, L. Boarino, A.M. Rossi, S. Borini, G. Lulli, A. Parisini	
Design Considerations for SOI Charge Pump Circuits	313
N. Subba, A. Salman, S. Mitra, D.E. Ioannou, C. Tretz	
High Performance Current-Mirrors Using Graded-Channel SOI NMOSFETs	319
M.A. Pavanello, J.A. Martino, D. Flandre	
Advanced RESURF Concepts in SOI Devices - Optimisation and Fabrication	325
A. Popescu, F. Udrea, K. Sheng, D. Garner, H.T. Lim, R. Ng, G. Khoo, W. Milne	
Fully Depleted SIMOX SOI Process Technology for Low Power Digital and RF Device	331
M. Itoh, Y. Kawai, S. Ito, K. Yokomizo, Y. Katakura, Y. Fukuda, F. Ichikawa	
	(Invited)
Combining SOI Technology and Asynchronous Design for Power Reduction	337
D. Donaghy, L. Brackenbury, S. Hall	

Validation of Extracted High Frequency Small Signal Parameters on SOI devices	343
A. Bracale, V. Ferlet-Cavrois, N. Fel, J.L. Gautier, J.L. Pelloie, J. du Port de Poncharra	
Effect of SiGe Layer on Electrical Characteristics of SGI-PDSOI MOSFETs	349
T.H. Choe, G.J. Bae, S.S. Kim, H.S. Rhee, K.W. Lee, N.I. Lee, H.S. Kang, K. Fujihara, H.K. Kang, J.T. Moon	
SOI Materials and Devices: A Designer Viewpoint	355
C. Tretz	(Invited)
Avalanche Currents in High-Voltage, Thin-Film Silicon-On-Insulator Devices	363
R.P. Zingg, H. Gerritsen, I. Emmerik-Weijland	
Isolation Techniques, Parasitic Sidewall Conduction and Narrow Channel Effects on SOI MOSFET's	369
D.E. Ioannou	(Invited)

PART V INNOVATING SOI DEVICES

Single Electron Transistors and Other Nanodevices on SOI	379
T. Hiramoto, N. Takahashi, H. Ishikuro, M. Saitoh	(Invited)
Silicon On Nothing (SON) - Fabrication, Material and Devices	391
T. Skotnicki	(Invited)
A Fully Depleted Delta-Channel SOI NMOSFET	403
Z. Jiao, C.A.T. Salama	
Self-Consistent Simulation of Nano Scale SOI Devices: The Case of Nano Flash Memory	409
X. Tang, X. Baie, J.P. Colinge, F. Van de Wiele, V. Bayot	
Effect of Quantum Confinement in SOI Single-Hole Transistors	415
X. Tang, X. Baie, J.P. Colinge, F. Van de Wiele, V. Bayot	
A Process-Based Compact Model for Double-Gate MOSFETs	421
M.H. Chiang, J.G. Fossum	
Performance of Double-Gate SOI nMOSFETs at Low Temperature	427
A. Vandooren, S. Cristoloveanu, J.P. Colinge, D. Flandre	
SiGe Heterojunction Bipolar Transistors on Insulator	433
P. Ashburn, H.A.W. El Mubarek, J.M. Bonar, W. Redman-White	(Invited)
Nano Gap Fabrication by Thermal Stress Cleavage on SIMOX SOI for Lateral FED Application	445
Y.H. Bae, W.J. Zang, S.H. Hahm, J.H. Lee, J.H. Lee	
A Tunneling-Barrier Junction MOSFET on SOI Substrates with a Suppressed Short-Channel Effect for the Ultimate Device Structure	451
Y. Omura	
Author Index	457
Subject Index	461