

# Table of Contents

## Preface

## Chapter 1: Semiconductor Materials for Power Electronics

### Electrical Properties of Heavily Al-Doped 4H-SiC

H. Matsuura, A. Takeshita, R. Nishihata, Y. Kondo and A. Hidaka 3

### A Method to Simulate Extrinsic Light Excitation of Vanadium-Compensated 6H-SiC

W.T. Fu, H.W. Yang, X. Chu, L.N. Wang and T. Xun 17

### Characterization of SiC/SiO<sub>2</sub> Interface State under Different NO Annealing

K.H. Yu, Y.W. Wang and J. Wang 25

## Chapter 2: Power Devices Designing

### The Gate Oxide Breakdown Failures of 4H-SiC MOS Devices

C.P. Wan, K.Y. Wang, T.C. Ye and H.Y. Xu 33

### Simulation of Threshold Voltage Instability of 4H-SiC MOSFET

S.J. Fan, M.M. Huang, C.P. Wan, M. Gong and H.Y. Xu 39

### The Investigation of 1200V SiC MOSFET Short-Circuit Ruggedness and Turn-Off Current Tail

X.G. Wei, Y.L. An, H.Y. Xu, B.Z. Wang, Q. Guo, F. Yang and H.Y. Wang 47

### Factors Affecting Bias Temperature Instability in 4H-SiC MOS Capacitors

K.Y. Wang, C.P. Wan, W.H. Lu, N.N. Ge and H.Y. Xu 53

### Reaction Kinetics Investigation of Ni Ohmic Contacts on N-Type 4H-SiC

N.N. Ge, C.P. Wan, Z. Jin and H.Y. Xu 59

### Influence of Acceptor Incomplete Ionization in p<sup>+</sup> Emitter on SiC LTT with n-Type Blocking Base

X. Wang, M.X. Qiu, H.B. Pu, Y.X. Zhang, J.N. Xu, H.Q. Wan and Z.Y. Wang 69

### Structure and the Thermal Management of a 3-D Silicon Carbide MOSFET Module

D.K. Ma, G.C. Xiao, K. Gao, Y. Nie, T.S. Yuan, L.J. Ma and L.L. Wang 75

### Automatic Design of a Busbar in SiC Controller

J. Cui, P.Q. Ning, Y.H. Huang, T. Fan, Y.H. Mei and G.Y. Lei 85