

# **Asia-Pacific Conference on Silicon Carbide and Related Materials 2022**

Selected peer-reviewed extended articles  
based on abstracts presented at the  
3<sup>rd</sup> Asia-Pacific Conference on  
Silicon Carbide and Related Materials 2022  
(APCSCRM 2022)

Aggregated Book

*Edited by*

**Yichen Liu, Heng Yu Xu and Ying Xi Niu**

■ *Scientific.Net* ■

**Copyright** © 2023 Trans Tech Publications Ltd, Switzerland

All rights reserved. No part of the contents of this publication may be reproduced or transmitted in any form or by any means without the written permission of the publisher.

Trans Tech Publications Ltd  
Seestrasse 24c  
CH-8806 Baech  
Switzerland  
<https://www.scientific.net>

Volume 83 of  
*Scientific Books Collection*  
ISBN 978-3-0364-0053-2

Full text available online at <https://www.scientific.net>

***Distributed worldwide by***  
Trans Tech Publications Ltd  
Seestrasse 24c  
CH-8806 Baech  
Switzerland  
Phone: +41 (44) 922 10 22  
e-mail: [sales@scientific.net](mailto:sales@scientific.net)

***Printed with permission by***  
Curran Associates Inc. (2023)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

Additional copies of this  
publication are available from:

Web: [www.proceedings.com/71079.html](http://www.proceedings.com/71079.html)

# Table of Contents

<b>Preface</b>	v
<b>Chapter 1: Semiconductor Materials for Power Electronics</b>	
<b>Electrical Properties of Heavily Al-Doped 4H-SiC</b> H. Matsuura, A. Takeshita, R. Nishihata, Y. Kondo and A. Hidaka .....	3
<b>A Method to Simulate Extrinsic Light Excitation of Vanadium-Compensated 6H-SiC</b> W.T. Fu, H.W. Yang, X. Chu, L.N. Wang and T. Xun .....	17
<b>Characterization of SiC/SiO<sub>2</sub> Interface State under Different NO Annealing</b> K.H. Yu, Y.W. Wang and J. Wang .....	25
<b>Chapter 2: Power Devices Designing</b>	
<b>The Gate Oxide Breakdown Failures of 4H-SiC MOS Devices</b> C.P. Wan, K.Y. Wang, T.C. Ye and H.Y. Xu .....	33
<b>Simulation of Threshold Voltage Instability of 4H-SiC MOSFET</b> S.J. Fan, M.M. Huang, C.P. Wan, M. Gong and H.Y. Xu .....	39
<b>The Investigation of 1200V SiC MOSFET Short-Circuit Ruggedness and Turn-Off Current Tail</b> X.G. Wei, Y.L. An, H.Y. Xu, B.Z. Wang, Q. Guo, F. Yang and H.Y. Wang .....	47
<b>Factors Affecting Bias Temperature Instability in 4H-SiC MOS Capacitors</b> K.Y. Wang, C.P. Wan, W.H. Lu, N.N. Ge and H.Y. Xu .....	53
<b>Reaction Kinetics Investigation of Ni Ohmic Contacts on N-Type 4H-SiC</b> N.N. Ge, C.P. Wan, Z. Jin and H.Y. Xu .....	59
<b>Influence of Acceptor Incomplete Ionization in p<sup>+</sup> Emitter on SiC LTT with n-Type Blocking Base</b> X. Wang, M.X. Qiu, H.B. Pu, Y.X. Zhang, J.N. Xu, H.Q. Wan and Z.Y. Wang .....	69
<b>Structure and the Thermal Management of a 3-D Silicon Carbide MOSFET Module</b> D.K. Ma, G.C. Xiao, K. Gao, Y. Nie, T.S. Yuan, L.J. Ma and L.L. Wang .....	75
<b>Automatic Design of a Busbar in SiC Controller</b> J. Cui, P.Q. Ning, Y.H. Huang, T. Fan, Y.H. Mei and G.Y. Lei .....	85
<b>Keyword Index</b> .....	93
<b>Author Index</b> .....	95