

Microtechnology and Thermal Problems in Electronics

(MicroTherm 2013)

Journal of Physics: Conference Series Volume 494

**Lodz, Poland
25-28 June 2013**

Editors:

Ewa Raj

Zbigniew Lisik

**ISBN: 978-1-63266-719-9
ISSN: 1742-6588**

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© by the Institute of Physics
All rights reserved.

Printed by Curran Associates, Inc. (2014)

For permission requests, please contact the Institute of Physics
at the address below.

Institute of Physics
Dirac House, Temple Back
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481
Fax: 44 1 17 920 0979

techtracking@iop.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

PAPERS

Normally-off GaN Transistors for Power Applications.....	1
<i>O. Hilt, E. Bahat-Treidel, F. Brunner, A. Knauer, R. Zhytnytska, P. Kotara, J. Wuerfl</i>	
Scaling Influence on the Thermal Behavior of Toward-THz SiGe:C HBTs.....	7
<i>V. D'Alessandro, G. Sasso, N. Rinaldi, K. Aufinger</i>	
Electro-Thermal Analysis and Optimisation of Edge Termination of Power Diode Supported by 2-D/3-D Numerical Modelling and Simulation.....	16
<i>P. Príbytný, D. Donoval, A. Chvála, J. Marek, M. Molnár</i>	
A Circuital Model of Switching Behaviour of 4H-SiC p^{+}-n-n^{+} Diodes Valid at any Current and Temperature	22
<i>S. Bellone, F. Della Corte, L. Di Benedetto, G. D. Licciardo</i>	
Hall Mobility Maps for 4H-Silicon Carbide by Monte Carlo Simulations	30
<i>J. Wozny, Z. Lisik, J. Podgórski</i>	
Three-Dimensional Electro-Thermal Verilog-A Model of Power MOSFET for Circuit Simulation.....	36
<i>A. Chvála, D. Donoval, J. Marek, P. Príbytný, M. Molnár, M. Mikolášek</i>	
Modelling Solar Cells with Thermal Phenomena Taken into Account	41
<i>K. Górecki, P. Górecki, K. Paduch</i>	
A Semiconductor Device Thermal Model Taking into Account Non-linearity and Multipathing of the Cooling System.....	49
<i>K. Górecki, J. Zarebski</i>	
Heat Transfer Enhancement by Finned Heat Sinks with Micro-structured Roughness	57
<i>L. Ventola, E. Chiavazzo, F. Calignano, D. Manfredi, P. Asinari</i>	
A System for Cooling Electronic Elements with an EHD Coolant Flow	66
<i>M. Tanski, M. Kocik, R. Barbucha, K. Garasz, J. Mizeraczyk, J. Krasniewski, M. Oleksy, A. Hapka, W. Janke</i>	
Emission and Structure Varieties in ZnO: Ag Nanorods Obtained by Ultrasonic Spray Pyrolysis	71
<i>E. Velázquez Lozada, T. V. Torchynska, J. L. Casas Espinola</i>	
Recombination Properties of Diode Structures by Study of Thermal Emission Beyond the Fundamental Absorption Band	77
<i>T. Piotrowski, M. Wegrzecki, A. Czerwinski, G. I. Teslenko, O. Y. Malyutenko, V. K. Malyutenko</i>	
Optical Fibre Angle Sensor Used in MEMS	82
<i>J. Golebiowski, Sz Milcarz, M. Rybak</i>	
Thick Film Heater for Sensor Application	87
<i>J. Milewski, M. Borecki, J. Kalenik, K. Król</i>	
Semiconductor and Ceramic Microstructure Made by Single Mode Fiber Laser	93
<i>R. Pawlak, M. Tomczyk, M. Walczak, P. Domagalski</i>	
Modelling Characteristics of Ferromagnetic Cores with the Influence of Temperature.....	101
<i>K. Górecki, M. Rogalska, J. Zarebski, K. Detka</i>	
Design and Modelling of a Silicon Optical MEMS Switch Controlled by Magnetic Field Generated by a Plain Coil.....	108
<i>J. Golebiowski, Sz Milcarz</i>	
Simulation of Thermal Processes in Superconducting Pancake Coils Cooled by GM Cryocooler	115
<i>M. Lebioda, J. Rymaszewski, E. Korzeniewska</i>	
Modelling of MOCVD Reactor: New 3D Approach	124
<i>E. Raj, Z. Lisik, P. Niedzielski, L. Ruta, M. Turczynski, X. Wang, A. Waag</i>	
Verification of Thermo-Fluidic CVD Reactor Model	134
<i>Z. Lisik, M. Turczynski, L. Ruta, E. Raj</i>	
Author Index	