

---

# Wide-Bandgap Semiconductor Materials and Devices 23

---

Editors:

J. Hite

V. Chakrapani


J. Zavada

T. Anderson

M. Tadjer

S. Kilgore

Sponsoring Division:

 Electronics and Photonics



Published by

The Electrochemical Society  
65 South Main Street, Building D  
Pennington, NJ 08534-2839, USA  
tel 609 737 1902  
fax 609 737 2743  
[www.electrochem.org](http://www.electrochem.org)

**ecstransactions**™

Vol. 108, No. 6

---

Copyright 2022 by The Electrochemical Society.  
All rights reserved.

This book has been registered with Copyright Clearance Center.  
For further information, please contact the Copyright Clearance Center,  
Salem, Massachusetts.

Published by:

The Electrochemical Society  
65 South Main Street  
Pennington, New Jersey 08534-2839, USA

Telephone 609.737.1902  
Fax 609.737.2743  
e-mail: [ecs@electrochem.org](mailto:ecs@electrochem.org)  
Web: [www.electrochem.org](http://www.electrochem.org)

ISSN 1938-5862 (online)

ISBN 978-1-60768-946-1 (PDF)

Printed in the United States of America.

---

## Table of Contents

<i>Preface</i>	<i>iii</i>
<i>(Invited)</i> Recent Progress on Molecular Beam Epitaxy of AlGa <sub>N</sub> Nanowires for Deep Ultraviolet Light Emitting Devices <i>S. Zhao, Q. Zhang, H. Parimoo, X. Yin</i>	3
<i>(Invited)</i> A Breakthrough Avalanche and Short Circuit Robustness in Vertical GaN Power Devices <i>Y. Zhang, R. Zhang, Q. Song, Q. Li, J. Liu</i>	11
<i>(Invited, Digital Presentation)</i> Fatigue-Resistant of Ag Sinter Joining on Ni-P/Pd/Au Finished DBA Substrate with Thick Ni-P Layer During Thermal Shock Test <i>C. Chen, K. Suganuma</i>	21
<i>(Invited, Digital Presentation)</i> Exploring the Potential and Limits of Gallium Oxide Electronics: In-Situ Dielectrics, Heterointegration and High-k Field Plates <i>S. Roy, A. Bhattacharyya, S. Krishnamoorthy</i>	27
Mechanism of Reverse Leakage Current in Schottky Diode Fabricated on Large Bandgap Semiconductors like Ga <sub>2</sub> O <sub>3</sub> or Diamond Part II <i>W. S. Lau</i>	39
Characterization Of Gallium Oxide With A Novel Non-Contact Electrical Metrology, CnCV, For Wide Bandgap Semiconductors <i>M. Wilson, D. Marinsky, A. Savtchouk, C. Almeida, B. Schrayner, J. Lagowski</i>	57
Thin Film Photodetectors Based on Zinc Oxide Nanoinks <i>S. Dawka, P. Duan, R. Sapkota, C. Papadopoulos</i>	63
Power Cycling Test Failure Analysis of SiC MOSFET Devices <i>M. KIM, I. Kang, J. H. SEO, T. E. Hong, J. H. Jeong, D. Yoo, H. J. Lee</i>	69

