



Circuit Design Techniques for Non-Crystalline Semiconductors

By Sanjiv Sambandan

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Despite significant progress in materials and fabrication technologies related to non-crystalline semiconductors, fundamental drawbacks continue to limit real-world application of these devices in electronic circuits. To help readers deal with problems such as low mobility and intrinsic time variant behavior, **Circuit Design Techniques for Non-Crystalline Semiconductors** outlines a systematic design approach, including circuit theory, enabling users to synthesize circuits without worrying about the details of device physics.

This book:

- Offers examples of how self-assembly can be used as a powerful tool in circuit synthesis
- Covers theory, materials, techniques, and applications
- Provides starting threads for new research

This area of research is particularly unique since it employs a range of disciplines including materials science, chemistry, mechanical engineering and electrical engineering. Recent progress in complementary polymer semiconductors and fabrication techniques such as ink-jet printing has opened doors to new themes and ideas. The book focuses on the central problem of threshold voltage shift and concepts related to navigating this issue when using non-crystalline semiconductors in electronic circuit design. Designed to give the non-electrical engineer a clear, simplified overview of fundamentals and tools to facilitate practical application, this book highlights design roadblocks and provides models and possible solutions for achieving successful circuit synthesis.

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Editorial Review

Review

"Macroelectronics has elicited much excitement in the past 10 years. There is however a clear disconnect between people who study materials or single devices and engineers who try to design circuits with these devices ... This is the first book I have seen where these issues are addressed explicitly. The author provides a few insights on strategies but in addition with the information contained in this book, practitioners have all the tools they need to come-up with designs and strategies of their own ... This book will be very useful to anyone who wants to take devices made with new non-crystalline semiconductors out of the lab and into the world of applications."

--Alberto Salleo, Stanford University

"...a well-organized reference that would be helpful to experts and students in the field of large-area electronics. The topics discussed could be used in a wide range of applications from conventional thin-film transistors to printed electronics."

--William S. Wong, University of Waterloo

About the Author

Sanjiv Sambandan is an assistant professor at the Flexible Electronics Lab, Department of Instrumentation and Applied Physics, Indian Institute of Science. Prior to this, he worked on large-area electronic systems on mechanically flexible substrates at Xerox Palo Alto Research Center.

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