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FOREWORD

Advances in electronics have followed Moore's Law, by scaling feature sizes every generation, doubling transistor integration capacity every two years, resulting in complex chips of today—a treadmill that we take for granted. No doubt that design complexity has grown tremendously and therefore gets tremendous attention, but often overlooked is the technology underlying reliability, and cost-effective test and product engineering of these complex chips. This is becoming especially crucial as we transition from yesterday's micro-electronics to today's nano-electronics.

This book, *CMOS Electronics: How It Works, How It Fails,* written by Professor Segura and Professor Hawkins, addresses just that—the technology underlying failure analysis, testing, and product engineering. The book starts with fundamental device physics, describes how MOS transistors work, how logic circuits are built, and then eases into failure mechanisms of these circuits. Thus the reader gets a very clear picture of failure mechanisms, how to detect them, and how to avoid them. The book covers the latest advances in failure analysis and test and product engineering, such as defects due to bridges, opens, and parametrics, and formulates test strategies to observe these defects in defect-based testing.

As technology progresses with even smaller geometries, you will have to comprehend test and product engineering upfront in the design. That is why this book is a refreshing change as it introduces design and test together.

I would like to thank Professor Segura and Professor Hawkins for giving me an opportunity to read a draft of this book; I surely enjoyed it, learned a lot from it, and I am sure that you the readers will find it rewarding, too.

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