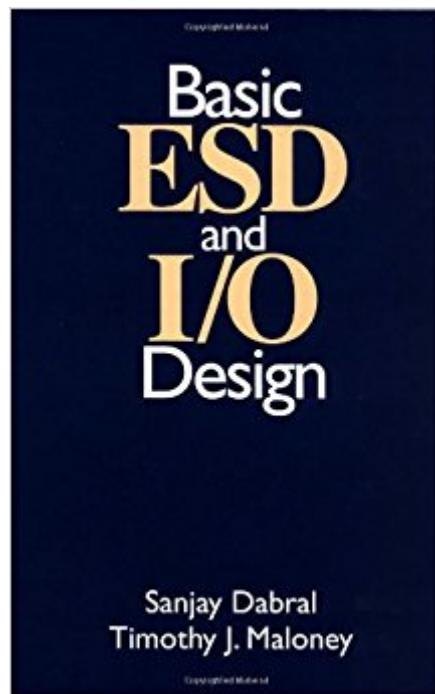


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# Basic ESD And I/O Design



## Synopsis

The first comprehensive guide to ESD protection and I/O design Basic ESD and I/O Design is the first book devoted to ESD (electrostatic discharge) protection and input/output design. Addressing the growing demand in industry for high-speed I/O designs, it bridges the gap between ESD research and current VLSI design practices and provides a much-needed reference for practicing engineers who are frequently called upon to learn the subject on the job. This volume presents an integrated treatment of ESD, I/O, and process parameter interactions that both I/O designers and process designers can use. It examines key factors in I/O and ESD design and testing, and helps the reader consider ESD and reliability issues up front when making I/O choices. Emphasizing clarity and simplicity, this book focuses on design principles that can be applied widely as this dynamic field continues to evolve. Basic ESD and I/O Design: \* Describes strategies for design-oriented ESD protection \* Explains layout methods that enhance ESD protection designs \* Addresses basic I/O designs, including new problems such as mixed voltage interfaces \* Discusses fabrication aspects affecting ESD and I/O protection \* Illustrates concepts using numerous figures and examples \* Expresses device physics in terms of simple electrical circuit models \* Cross-references the material to standard texts in the field Essential for engineers in industry and anyone designing circuits, systems, or devices for future technologies, Basic ESD and I/O Design is also a useful reference for researchers and graduate students involved in core VLSI design or computer architecture.

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SANJAY DABRAL received his PhD in electrical engineering from Rensselaer Polytechnic Institute. An independent consultant, he is also involved in developing high-speed I/O buses. TIMOTHY J. MALONEY has degrees in physics and electrical engineering from MIT and Cornell University. He is a Principal Engineer at Intel Corporation and has won the Intel Achievement Award for his patented ESD protection devices. A Senior Member of the IEEE, he has several patents issued and several more pending.

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Today it is hard to find a book dealing with ESD and IO design comprehensively, and this book is a make-up. It covers ESD theories, prevention techniques and layout, basic IO transceiver design,

mixed-voltage IO cell design and etc. Unfortunately, the authors did not address some of the designs in depth, as its title is "Basic ESD and I/O Design".

If you are designing i/o design this is the book that you want to have. After reviewing basic concepts provided by the book, you can improve your esd io stureture by a few 1kv. It has excellent design examples for ESD I/O from grounded gate MOS devices to SCR. This book however needs to address low capacitance ESD I/O stureture for RF application.

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