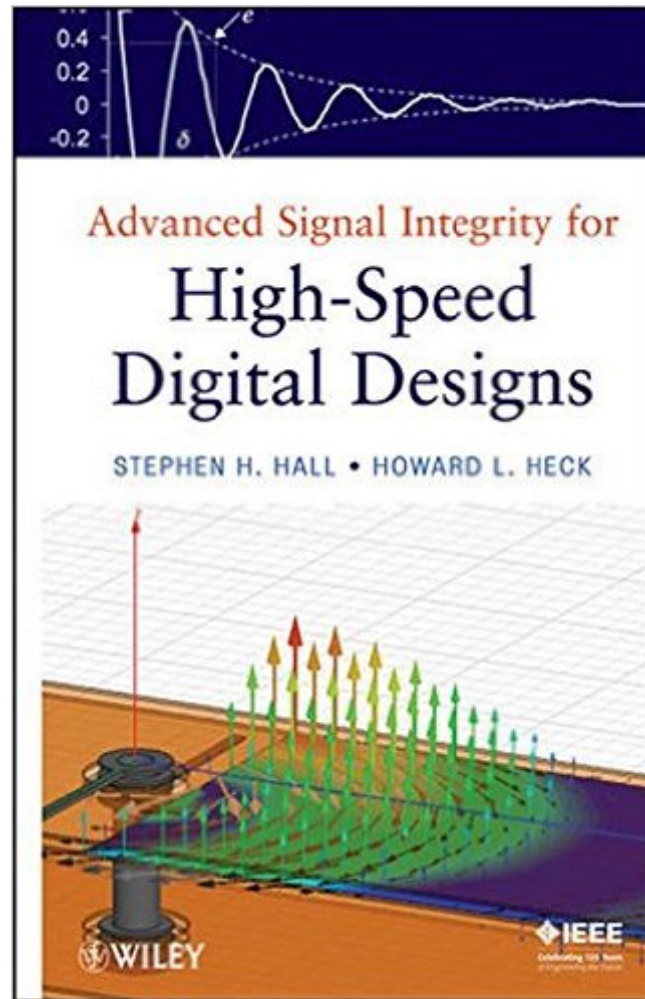


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# Advanced Signal Integrity For High-Speed Digital Designs



## Synopsis

A synergistic approach to signal integrity for high-speed digital design This book is designed to provide contemporary readers with an understanding of the emerging high-speed signal integrity issues that are creating roadblocks in digital design. Written by the foremost experts on the subject, it leverages concepts and techniques from non-related fields such as applied physics and microwave engineering and applies them to high-speed digital designâcreating the optimal combination between theory and practical applications. Following an introduction to the importance of signal integrity, chapter coverage includes: Electromagnetic fundamentals for signal integrity Transmission line fundamentals Crosstalk Non-ideal conductor models, including surface roughness and frequency-dependent inductance Frequency-dependent properties of dielectrics Differential signaling Mathematical requirements of physical channels S-parameters for digital engineers Non-ideal return paths and via resonance I/O circuits and models Equalization Modeling and budgeting of timing jitter and noise System analysis using response surface modeling Each chapter includes many figures and numerous examples to help readers relate the concepts to everyday design and concludes with problems for readers to test their understanding of the material. Advanced Signal Integrity for High-Speed Digital Designs is suitable as a textbook for graduate-level courses on signal integrity, for programs taught in industry for professional engineers, and as a reference for the high-speed digital designer.

## Book Information

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## Customer Reviews

Heck and Hall have done a fantastic job in summarizing both the theory and practice of solving today's SI issues. The math behind topics such as linear network theory, frequency-dependent dielectric effects and filter design for equalization is rigorous, yet ample space is set aside for practical guidance as well. Of particular note is their thorough treatment of hot PCB SI topics as dielectric loss and surface roughness modeling, and preservation of causality in transmission line models. Transmitter and receiver equalization (DFE and CTLE) are well-described, as are analysis techniques such as peak distortion and bit-error rate. Finally, their summary of response surface modeling (RSM) approaches to design of experiments (DOE) is perhaps the first and certainly the most comprehensive overview of those methods as applied to PCB SI design available today. A book well worth purchasing if you are involved in SI modeling, SI simulation or PCB design.

The book has some great information, but the formatting could be much friendlier. Often there are 3 or more equations for the same calculation that are used as the material is introduced and additional complicating factors are included, but that is not made clear, leaving confusion about which form of the equation should be used. Reformatting to introduce the important final result, then working through the development of the result would be good. Or some other formatting method to make the important final result equations and summary stand out from the intermediate simplified steps

This is one of the very few books that really go deeply inside in theory giving the reader the possibility to understand what is going on. This amazing work is not a rule of thumb book, neither a handbook. Rather it offers a full comprehension of signal integrity related topics as any, enabling the reader to unveil by himself issues encountered in practice.

This book is an indepth detailed and mathematical explanation of signal integrity. I fully recommend this book to learn about the basics and the details of signal integrity. I started reading this book with a background of electronics but only a brief understanding of signal integrity. This book got me up to speed with everything I need to know for the modern electronics industry and provides an important reference in my library. I fully recommend it. The only failing of the book is that it can be a little too mathematical. With completely equations of various effects provided but nothing useful (if less accurate) that you can use on a day-to-day basis to make design decisions with.

I recommend it to other SI engineers that are looking for more advanced SI information. For me, there were a fair number of sections that helped fill in the gaps on my understanding. Which is

great.

A really good book! Written by signal integrity engineers at Intel who know the problems of SI firsthand and the modern solutions to those problems.

I work with Howard Heck in committee. These guys wrote an excellent treatise on the subject.

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