1. **Record Nr.**   UNINA9910627256203321

   Autore   Tran Thanh T.

   Titolo   High-Speed System and Analog Input/Output Design / / by Thanh T. Tran

   Pubbl/distr/stampa   Cham : , : Springer International Publishing : , : Imprint : Springer, , 2023

   ISBN   9783031049545
   9783031049538

   Edizione   [2nd ed. 2023.]

   Descrizione fisica   1 online resource (225 pages)

   Disciplina   621.3815
   621.3822

   Soggetti   Telecommunication
   Electronic circuits
   Signal processing
   Electronics
   Communications Engineering, Networks
   Electronic Circuits and Systems
   Digital and Analog Signal Processing
   Electronics and Microelectronics, Instrumentation

   Lingua di pubblicazione   Inglese

   Formato   Materiale a stampa

   Livello bibliografico   Monografia

   Nota di bibliografia   Includes bibliographical references and index.

   Nota di contenuto   Introduction -- Challenges of High-Speed System Design -- Understanding AC and DC Input/Output Signals -- Practical Analog Filter Design -- Transmission Line (TL) Effects -- S-Parameters -- Effects of Crosstalk -- Power Supply Design Considerations -- Power Supply Decoupling -- Phase-Locked Loop (PLL) -- Data Converter Overview -- Printed Circuit Board (PCB) -- Electromagnetic Interference (EMI) -- Memory Sub-System Design Considerations -- Conclusion.

   Sommario/riassunto   The new edition of this textbook is based on Dr. Thanh T. Tran's 10+ years' experience teaching high-speed digital and analog design courses at Rice University and 30+ years' experience working in high-speed system design, including signal and power integrity in digital signal processing (DSP), computer, and embedded system. The book provides hands-on, practical instruction on high-speed digital and

analog design for students and working engineers. The author first presents good high-speed digital and analog design practices that minimize both component and system noise and ensure system design success. He then presents guidelines to be used throughout the design process to reduce noise and radiation and to avoid common pitfalls while improving quality and reliability. The book is filled with tips on design and system simulation that minimize late stage redesign costs and product shipment delays. Hands-on design examples focusing on audio, video, analog filters, DDR memory, and power supplies are featured throughout. In addition, the author provides a practical approach to design multi-gigahertz high-speed serial busses (USB-C, PCIe, HDMI, DP) and simulate printed circuit board insertion and return loss using s-parameter models. Presents a practical hands-on approach to high speed system design, including spice and IBIS and s-parameter simulations; Provides design for low noise and radiation by proper printed circuit board floor planning and stackup, effective power supply decoupling techniques, grounding, and analog/digital system partitioning; Presents designs and simulations of passive and active analog filters required for analog inputs and outputs of a system, including a review of AC-coupled and DC-coupled circuits; Demonstrates the use of multiple computer aided engineering tools (spice, IBIS, and s-parameter) to solve design problems and to do critical timing analysis. Dr. Thanh Tran, a professor in the practice at Rice University and a server platform architect at AMD, earned his BSEE from the University of Illinois at Urbana-Champaign, and M.S. and Ph.D. in Electrical Engineering from the University of Houston. He is an accomplished engineer with extensive hands-on experience in architecting and designing complex systems and currently holds 37 issued patents.