

Microelectronic Circuits Sedra Smith 6th Solution

Unfriendly to conventional electronic devices, circuits, and systems, extreme environments represent a serious challenge to designers and mission architects. The first truly comprehensive guide to this specialized field, *Extreme Environment Electronics* explains the essential aspects of designing and using devices, circuits, and electronic systems intended to operate in extreme environments, including across wide temperature ranges and in radiation-intense scenarios such as space. The *Definitive Guide to Extreme Environment Electronics* Featuring contributions by some of the world's foremost experts in extreme environment electronics, the book provides in-depth information on a wide array of topics. It begins by describing the extreme conditions and then delves into a description of suitable semiconductor technologies and the modeling of devices within those technologies. It also discusses reliability issues and failure mechanisms that readers need to be aware of, as well as best practices for the design of these electronics. Continuing beyond just the "paper design" of building blocks, the book rounds out coverage of the design realization process with verification techniques and chapters on electronic packaging for extreme environments. The final set of chapters describes actual chip-level designs for applications in energy and space exploration. Requiring only a basic background in electronics, the book combines theoretical and practical aspects in each self-contained chapter. Appendices supply additional background material. With its broad coverage and depth, and the expertise of the contributing authors, this is an invaluable reference for engineers, scientists, and technical managers, as well as researchers and graduate students. A hands-on resource, it explores what is required to successfully operate electronics in the most demanding conditions.

This book is the first standalone book that combines research into low-noise amplifiers (LNAs) with research into millimeter-wave circuits. In compiling this book, the authors have set two research objectives. The first is to bring together the research context behind millimeter-wave circuit operation and the theory of low-noise amplification. The second is to present new research in this multi-disciplinary field by dividing the common LNA configurations and typical specifications into subsystems, which are then optimized separately to suggest improvements in the current state-of-the-art designs. To achieve the second research objective, the state-of-the-art LNA configurations are discussed and the weaknesses of state-of-the-art configurations are considered, thus identifying research gaps. Such research gaps, among others, point towards optimization – at a systems and microelectronics level. Optimization topics include the influence of short wavelength, layout and crosstalk on LNA performance. Advanced fabrication technologies used to decrease the parasitics of passive and active devices are also explored, together with packaging technologies such as silicon-on-chip and silicon-on-package, which are proposed as alternatives to traditional IC implementation. This research outcome builds through innovation. Innovative ideas for LNA construction are explored, and alternative design methodologies are deployed, including LNA/antenna co-design or utilization of the electronic design automation in the research flow. The book also offers the authors' proposal for streamlined automated LNA design flow, which focuses on LNA as a collection of highly optimized subsystems.

This volume presents the proceedings of the Brazilian Congress on Biomedical Engineering (CBEB 2018). The conference was organised by the Brazilian Society on Biomedical Engineering (SBEB) and held in Armação de Buzios, Rio de Janeiro, Brazil from 21-25 October, 2018. Topics of the proceedings include these 11 tracks: • Bioengineering • Biomaterials, Tissue Engineering and Artificial Organs • Biomechanics and Rehabilitation • Biomedical Devices and Instrumentation • Biomedical Robotics, Assistive Technologies and Health Informatics • Clinical Engineering and Health Technology Assessment • Metrology, Standardization, Testing and Quality in Health • Biomedical Signal and Image Processing • Neural Engineering • Special Topics • Systems and Technologies for Therapy and Diagnosis

This book addresses the need for energy-efficient amplifiers, providing gain enhancement strategies, suitable to run in parallel with lower supply voltages, by introducing a new family of single-stage cascode-free amplifiers, with proper design, optimization, fabrication and experimental evaluation. The authors describe several topologies, using the UMC 130 nm CMOS technology node with standard-VT devices, for proof-of-concept, achieving results far beyond what is achievable with a classic single-stage folded-cascode amplifier. Readers will learn about a new family of circuits with a broad range of applications, together with the familiarization with a state-of-the-art electronic design automation methodology used to explore the design space of the proposed circuit family.

A practical guide to analog and mixed-signal electronics, with an emphasis on design problems and applications This book provides an in-depth coverage of essential analog and mixed-signal topics such as power amplifiers, active filters, noise and dynamic range, analog-to-digital and digital-to-analog conversion techniques, phase-locked loops, and switching power supplies. Readers will learn the basics of linear systems, types of nonlinearities and their effects, op-amp circuits, the high-gain analog filter-amplifier, and signal generation. The author uses system design examples to motivate theoretical explanations and covers system-level topics not found in most textbooks. Provides references for further study and problems at the end of each chapter Includes an appendix describing test equipment useful for analog and mixed-signal work Examines the basics of linear systems, types of nonlinearities and their effects, op-amp circuits, the high-gain analog filter-amplifier, and signal generation Comprehensive and detailed, *Analog and Mixed-Signal Electronics* is a great introduction to analog and mixed-signal electronics for EE undergraduates, advanced electronics students, and for those involved in computer engineering, biomedical engineering, computer science, and physics.

Explore this comprehensive introduction to the foundations of photodetection from one of the leading voices in the field The newly revised *Photodetectors: Devices, Circuits and Applications* delivers a thoroughly updated exploration of the fundamentals of photodetection and the novel technologies and concepts that have arisen since the release of the first edition twenty years ago. The book offers discussions of established and emerging photodetection technologies, including photomultipliers, the SPAD, the SiPM, the SNSPD, the UTC, the WGPDP/TWPD, the QWIP, and the LT-GaAs. New examinations of correlation measurements on ultrafast pulses and single-photon detectors for quantum communications and LiDARs have also been added. Each chapter includes selected problems for students to work through to aid in learning and retention. A booklet of solutions is also provided. The book is especially ideal for students and faculties of Engineering, with an emphasis on first principles, design, and the engineering of photodetectors. Issues in the book are grouped through the development of concepts, as opposed to collections of technical details. Perfect for undergraduate students interested in the science or design of modern optoelectronics, *Photodetectors: Devices, Circuits and Applications* also belongs on the bookshelves of professors teaching PhD seminars in advanced courses on photodetection and noise, as well as engineers and physicists seeking a guide to an optimum

photodetection solution.

This book introduces research presented at the “International Conference on Artificial Intelligence: Advances and Applications-2019 (ICAIAA 2019),” a two-day conference and workshop bringing together leading academicians, researchers as well as students to share their experiences and findings on all aspects of engineering applications of artificial intelligence. The book covers research in the areas of artificial intelligence, machine learning, and deep learning applications in health care, agriculture, business and security. It also includes research in core concepts of computer networks, intelligent system design and deployment, real-time systems, WSN, sensors and sensor nodes, SDN and NFV. As such it is a valuable resource for students, academics and practitioners in industry working on AI applications.

Swift ion beam analysis (IBA) of materials and their surfaces has been widely applied to many fields over the last half century, constantly evolving to meet new requirements and to take advantage of developments in particle detection and data treatment. Today, emerging fields in nanosciences introduce extreme demands to analysis methods at the nanoscale. This book addresses how analysis with swift ion beams is rising to meet such needs. Aimed at early stage researchers and established researchers wishing to understand how IBA can contribute to their analytical requirements in nanosciences, the basics of the interactions of charged particles with matter, as well as the operation of the relevant equipment, are first presented. Many recent examples from nanoscience research are then explored in which the specific analytical capabilities of IBA are emphasized, together with the place of IBA alongside the wealth of other analytical methods.

This book describes Smart Cities and the information technologies that will provide better living conditions in the cities of tomorrow. It brings together research findings from 27 countries across the globe, from academia, industry and government. It addresses a number of crucial topics in state of the arts of technologies and solutions related to smart cities, including big data and cloud computing, collaborative platforms, communication infrastructures, smart health, sustainable development and energy management. Information Innovation Technology in Smart Cities is essential reading for researchers working on intelligence and information communication systems, big data, Internet of Things, Cyber Security, and cyber-physical energy systems. It will be also invaluable resource for advanced students exploring these areas.

In the electronics industry today consumer demand for devices with hyper-connectivity and mobility has resulted in the development of a complete system on a chip (SoC). Using the old ‘rule of thumb’ design methods of the past is no longer feasible for these new complex electronic systems. To develop highly successful systems that meet the requirements and quality expectations of customers, engineers now need to use a rigorous, model-based approach in their designs. This book provides the definitive guide to the techniques, methods and technologies for electronic systems engineers, embedded systems engineers, and hardware and software engineers to carry out model-based electronic system design, as well as for students of IC systems design. Based on the authors’ considerable industrial experience, the book shows how to implement the methods in the context of integrated circuit design flows. Complete guide to methods, techniques and technologies of model-based engineering design for developing robust electronic systems Written by world experts in model-based design who have considerable industrial experience Shows how to adopt the methods using numerous industrial examples in the context of integrated circuit design

Implantable sensing, whether used for transient or long-term monitoring of in vivo physiological, bio-electrical, bio-chemical and metabolic changes, is a rapidly advancing field of research and development. Underpinned by increasingly small, smart and energy efficient designs, they become an integral part of surgical prostheses or implants for both acute and chronic conditions, supporting optimised, context aware sensing, feedback, or stimulation with due consideration of system level impact. From sensor design, fabrication, on-node processing with application specific integrated circuits, to power optimisation, wireless data paths and security, this book provides a detailed explanation of both the theories and practical considerations of developing novel implantable sensors. Other topics covered by the book include sensor embodiment and flexible electronics, implantable optical sensors and power harvesting. Implantable Sensors and Systems – from Theory to Practice is an important reference for those working in the field of medical devices. The structure of the book is carefully prepared so that it can also be used as an introductory reference for those about to enter into this exciting research and developing field.

This peer-reviewed book explores the methodologies that are used for effective research, design and innovation in the vast field of millimeter-wave circuits, and describes how these have to be modified to fit the uniqueness of high-frequency nanoelectronics design. Each chapter focuses on a specific research challenge related to either small form factors or higher operating frequencies. The book first examines nanodevice scaling and the emerging electronic design automation tools that can be used in millimeter-wave research, as well as the singular challenges of combining deep-submicron and millimeter-wave design. It also demonstrates the importance of considering, in the millimeter-wave context, system-level design leading to differing packaging options. Further, it presents integrated circuit design methodologies for all major transceiver blocks typically employed at millimeter-wave frequencies, as these methodologies are normally fundamentally different from the traditional design methodologies used in analogue and lower-frequency electronics. Lastly, the book discusses the methodologies of millimeter-wave research and design for extreme or harsh environments, rebooting electronics, the additional opportunities for terahertz research, and the main differences between the approaches taken in millimeter-wave research and terahertz research.

This book explains the application of recent advances in computational intelligence – algorithms, design methodologies, and synthesis techniques – to the design of integrated circuits and systems. It highlights new biasing and sizing approaches and optimization techniques and their application to the design of high-performance digital, VLSI, radio-frequency, and mixed-signal circuits and systems. This first of two related volumes addresses the design of analog and mixed-signal (AMS) and radio-frequency (RF) circuits, with 17 chapters grouped into parts on analog and mixed-signal applications, and radio-frequency design. It will be of interest to practitioners and researchers in computer science and electronics engineering engaged with the design of electronic circuits.

The acquisition and interpretation of images is a central capability in almost all scientific and technological domains. In particular, the acquisition of electromagnetic radiation, in the form of visible light, UV, infrared, X-ray, etc. is of enormous practical importance. The ultimate sensitivity in electronic imaging is the detection of individual photons. With this book, the first comprehensive review of all aspects of single-photon electronic imaging has been created. Topics include theoretical basics, semiconductor fabrication, single-photon detection principles, imager design and applications of different spectral domains. Today, the solid-state fabrication capabilities for several types of image sensors has advanced to a point, where uncooled single-photon electronic imaging will soon become a consumer product. This book is giving a specialist’s view from different domains to the forthcoming “single-photon imaging” revolution. The various aspects of single-photon imaging are treated by internationally renowned, leading scientists and technologists who have all pioneered their respective fields.

This book gathers a collection of papers by international experts that were presented at the International Conference on NextGen Electronic Technologies (ICNETS2-2016). ICNETS2 encompassed six symposia covering all aspects of the electronics and communications domains, including relevant nano/micro materials and devices. Highlighting the latest research on nanoelectronic materials and devices, the book offers a valuable guide for researchers, practitioners and students working in the core areas of functional electronics nanomaterials, nanocomposites for energy application, sensing and high strength materials and simulation of novel device design structures for ultra-low power applications.

This book provides a system-level approach to making packaging decisions for millimeter-wave transceivers. In electronics, the packaging forms a bridge between the integrated circuit or individual device and the rest of the electronic system, encompassing all technologies between the two. To be able to make well-founded packaging decisions, researchers need to understand a broad range of aspects, including:

concepts of transmission bands, antennas and propagation, integrated and discrete package substrates, materials and technologies, interconnects, passive and active components, as well as the advantages and disadvantages of various packages and packaging approaches, and package-level modeling and simulation. Packaging also needs to be considered in terms of system-level testing, as well as associated testing and production costs, and reducing costs. This peer-reviewed work contributes to the extant scholarly literature by addressing the aforementioned concepts and applying them to the context of the millimeter-wave regime and the unique opportunities that this transmission approach offers.

Oxford University Press congratulates Dr Adel Sedra on his appointment to the Order of Ontario on January 24, 2014. Please follow this link for more information: <http://news.ontario.ca/mci/en/2014/01/new-appointees-to-the-order-of-ontario.html> Click here/a Used by more than one million students worldwide, Microelectronic Circuits continues its standard of innovation built on a solid pedagogical foundation. All material in this edition is thoroughly updated to reflect changes in technology-CMOS technology in particular. These technological changes have shaped the book's organization and topical coverage, making it the most current resource available.

In two editions spanning more than a decade, The Electrical Engineering Handbook stands as the definitive reference to the multidisciplinary field of electrical engineering. Our knowledge continues to grow, and so does the Handbook. For the third edition, it has expanded into a set of six books carefully focused on a specialized area or field of study. Each book represents a concise yet definitive collection of key concepts, models, and equations in its respective domain, thoughtfully gathered for convenient access. Circuits, Signals, and Speech and Image Processing presents all of the basic information related to electric circuits and components, analysis of circuits, the use of the Laplace transform, as well as signal, speech, and image processing using filters and algorithms. It also examines emerging areas such as text-to-speech synthesis, real-time processing, and embedded signal processing. Each article includes defining terms, references, and sources of further information. Encompassing the work of the world's foremost experts in their respective specialties, Circuits, Signals, and Speech and Image Processing features the latest developments, the broadest scope of coverage, and new material on biometrics.

During the ten years since the appearance of the groundbreaking, bestselling first edition of The Electronics Handbook, the field has grown and changed tremendously. With a focus on fundamental theory and practical applications, the first edition guided novice and veteran engineers along the cutting edge in the design, production, installation, operation, and maintenance of electronic devices and systems. Completely updated and expanded to reflect recent advances, this second edition continues the tradition. The Electronics Handbook, Second Edition provides a comprehensive reference to the key concepts, models, and equations necessary to analyze, design, and predict the behavior of complex electrical devices, circuits, instruments, and systems. With 23 sections that encompass the entire electronics field, from classical devices and circuits to emerging technologies and applications, The Electronics Handbook, Second Edition not only covers the engineering aspects, but also includes sections on reliability, safety, and engineering management. The book features an individual table of contents at the beginning of each chapter, which enables engineers from industry, government, and academia to navigate easily to the vital information they need. This is truly the most comprehensive, easy-to-use reference on electronics available.

Designed to accompany Microelectronic Circuits by Adel S. Sedra and Kenneth C. Smith, Laboratory Explorations invites students to explore the realm of real-world engineering through practical, hands-on experiments. Taking a "learn-by-doing" approach, it presents labs that focus on the development of practical engineering skills and design practices. Experiments start from concepts and hand analysis, and include simulation, measurement, and post-measurement discussion components. A complete solutions manual is available to adopting instructors.

~~~~~ FEATURES \* Includes clear and concise experiments of varying levels of difficulty \* Challenging "Extra Exploration" sections follow each experiment \* Each experiment is conveniently designed to fit into a 2- or 3-hour lab period and can be completed using minimal equipment \* Also compatible with National Instrument's myDAQ, giving students the opportunity to complete assignments outside of the traditional lab environment ~~~~~ PACKAGING OPTIONS Bundle Laboratory Explorations with Microelectronic Circuits, Sixth Edition, for great savings! Speak to your Oxford University Press sales representative for more information. PACKAGE 1 Laboratory Explorations + Microelectronic Circuits, 6E Package ISBN: 978-0-19-932924-3 PACKAGE 2 Laboratory Explorations + Microelectronic Circuits, 6E + FREE Added Problems Supplement Package ISBN: 978-0-19-932923-6

This book constitutes the refereed proceedings of the 5th International Conference on Security, Privacy, and Applied Cryptography Engineering, SPACE 2015, held in Jaipur, India, in October 2015. The 17 full papers presented in this volume were carefully reviewed and selected from 57 submissions. The book also contains 4 invited talks in full-paper length. The papers are devoted to various aspects of security, privacy, applied cryptography, and cryptographic engineering.

This book introduces Radio Frequency Source Coding to a broad audience. The author blends theory and practice to bring readers up-to-date in key concepts, underlying principles and practical applications of wireless communications. The presentation is designed to be easily accessible, minimizing mathematics and maximizing visuals.

This second edition of the highly acclaimed RF Power Amplifiers has been thoroughly revised and expanded to reflect the latest challenges associated with power transmitters used in communications systems. With more rigorous treatment of many concepts, the new edition includes a unique combination of class-tested analysis and industry-proven design techniques. Radio frequency (RF) power amplifiers are the fundamental building blocks used in a vast variety of wireless communication circuits, radio and TV broadcasting transmitters, radars, wireless energy transfer, and industrial processes. Through a combination of theory and practice, RF Power Amplifiers, Second Edition provides a solid understanding of the key concepts, the principle of operation, synthesis, analysis, and design of RF power amplifiers. This extensive update boasts: up to date end of chapter summaries; review questions and problems; an expansion on key concepts; new examples related to real-world applications illustrating key concepts and brand new chapters covering 'hot topics' such as RF LC oscillators and dynamic power supplies. Carefully edited for superior readability, this work remains an essential reference for research & development staff and design engineers. Senior level undergraduate and graduate electrical engineering students will also find it an invaluable resource with its practical examples & summaries, review questions and end of chapter problems. Key features: • A fully revised solutions manual is now hosted on a companion website alongside new simulations. • Extended treatment of a broad range of topologies of RF power amplifiers. • In-depth treatment of state-of-the art of modern transmitters and a new chapter on oscillators. • Includes problem-solving methodology, step-by-step derivations and closed-form design equations with illustrations.

The fourth edition of Microelectronic Circuits is an extensive revision of the classic text by Sedra and Smith. The primary objective of this textbook remains the development of the student's ability to analyse and design electronic circuits.

This book presents select proceedings of International Conference on Energy, Material Sciences and Mechanical Engineering (EMSME) 2020, held at National Institute of Technology Delhi. Various topics covered in this book include clean materials, solar energy systems, wind energy systems, power optimization, grid integration of renewable energy, smart energy storage technologies, artificial intelligence in solar and wind system, analysis of clean energy material in environment, converter topology, modelling and simulation. This book will be useful for researchers and professionals working in the areas of solar material science, electrical engineering, and energy technologies.

This practical introduction explains exactly how digital circuits are designed, from the basic circuit to the advanced system. It covers combinational logic circuits, which collect logic signals, to sequential logic circuits, which embody time and memory to progress through sequences of states. The primer also highlights digital arithmetic and the integrated circuits that implement the logic functions. Based on the author's extensive experience in teaching digital electronics to undergraduates, the book translates theory directly into practice and presents the essential information in a compact, digestible style. Worked problems and examples are accompanied by abbreviated solutions, with demonstrations to ensure that the design material and the circuits' operation are fully understood. This is essential reading for any electronic or electrical engineering student new to digital electronics and requiring a succinct yet comprehensive introduction.

This book deals with key aspects of design of digital electronic circuits for different families of elementary electronic devices. Implementation of both simple and complex logic circuits are considered in detail, with special attention paid to the design of digital systems based on complementary metal-oxide-semiconductor (CMOS) and Pass-Transistor Logic (PTL) technologies acceptable for use in planar microelectronics technology. It is written for students in electronics and microelectronics, with exercises and solutions provided.

This book contributes to the body of scholarly knowledge by exploring the main ideas of wireless networks of past, present, and future, trends in the field of networking, the capabilities of 5G and technologies that are potential enablers of 6G, potential 6G applications and requirements, as well as unique challenges and opportunities that 6G research is going to offer over the next decade. It covers research topics such as communication via millimeter-waves, terahertz waves and visible light to enable faster speeds, as well as research into achieving other basic requirements of 6G networks. These include low end-to-end latency, high energy efficiency, coverage that is ubiquitous and always-on, integration of terrestrial wireless with non-terrestrial networks, network management that is made more effective by connected intelligence with machine learning capabilities, as well as support for the evolution of old service classes and support for new ones.

This book constitutes the refereed proceedings of the Third IFIP WG 5.5/SOCOLNET Doctoral Conference on Computing, Electrical and Industrial Systems, DoCEIS 2012, held in Costa de Caparica, Portugal, in February 2012. The 65 revised full papers were carefully reviewed and selected from numerous submissions. They cover a wide spectrum of topics ranging from collaborative enterprise networks to microelectronics. The papers are organized in topical sections on collaborative systems, service orientation, knowledge and content management, human interaction, Petri nets, smart systems, robotic systems, perceptual systems, signal processing, energy, renewable energy, energy smart grid, power electronics, electronics, optimization in electronics, telecommunications and electronics, and electronic materials. The book also includes papers from the Workshop on Data Analysis and Modeling Retina in Health and Disease.

In two editions spanning more than a decade, The Electrical Engineering Handbook stands as the definitive reference to the multidisciplinary field of electrical engineering. Our knowledge continues to grow, and so does the Handbook. For the third edition, it has grown into a set of six books carefully focused on specialized areas or fields of study. Each one represents a concise yet definitive collection of key concepts, models, and equations in its respective domain, thoughtfully gathered for convenient access. Combined, they constitute the most comprehensive, authoritative resource available. Circuits, Signals, and Speech and Image Processing presents all of the basic information related to electric circuits and components, analysis of circuits, the use of the Laplace transform, as well as signal, speech, and image processing using filters and algorithms. It also examines emerging areas such as text to speech synthesis, real-time processing, and embedded signal processing. Electronics, Power Electronics, Optoelectronics, Microwaves, Electromagnetics, and Radar delves into the fields of electronics, integrated circuits, power electronics, optoelectronics, electromagnetics, light waves, and radar, supplying all of the basic information required for a deep understanding of each area. It also devotes a section to electrical effects and devices and explores the emerging fields of microlithography and power electronics. Sensors, Nanoscience, Biomedical Engineering, and Instruments provides thorough coverage of sensors, materials and nanoscience, instruments and measurements, and biomedical systems and devices, including all of the basic information required to thoroughly understand each area. It explores the emerging fields of sensors, nanotechnologies, and biological effects. Broadcasting and Optical Communication Technology explores communications, information theory, and devices, covering all of the basic information needed for a thorough understanding of these areas. It also examines the emerging areas of adaptive estimation and optical communication. Computers, Software Engineering, and Digital Devices examines digital and logical devices, displays, testing, software, and computers, presenting the fundamental concepts needed to ensure a thorough understanding of each field. It treats the emerging fields of programmable logic, hardware description languages, and parallel computing in detail. Systems, Controls, Embedded Systems, Energy, and Machines explores in detail the fields of energy devices, machines, and systems as well as control systems. It provides all of the fundamental concepts needed for thorough, in-depth understanding of each area and devotes special attention to the emerging area of embedded systems. Encompassing the work of the world's foremost experts in their respective specialties, The Electrical Engineering Handbook, Third Edition remains the most convenient, reliable source of information available. This edition features the latest developments, the broadest scope of coverage, and new material on nanotechnologies, fuel cells, embedded systems, and biometrics. The engineering community has relied on the Handbook for more than twelve years, and it will continue to be a platform to launch the next wave of advancements. The Handbook's latest incarnation features a protective slipcase, which helps you stay organized without overwhelming your bookshelf. It is an attractive addition to any collection, and will help keep each volume of the Handbook as fresh as your latest research.

The four-volume set LNAI 6881-LNAI 6884 constitutes the refereed proceedings of the 15th International Conference on Knowledge-Based Intelligent Information and Engineering Systems, KES 2011, held in Kaiserslautern, Germany, in September 2011. Part 3: The total of 244 high-quality papers presented were carefully reviewed and selected from numerous submissions. The 67 papers of Part 3 are organized in topical sections on skill acquisition and ubiquitous human computer interaction, intelligent network and service, management technologies from the perspective of kansei engineering and emotion, data mining and service science for innovation, knowledge-based systems for e-business, knowledge engineering applications in process systems and plant operations, advanced design techniques for adaptive hardware and systems, human-oriented learning technology and learning support environment, design of social intelligence and creativity environment. This book presents design methods and considerations for digitally-assisted wideband millimeter-wave transmitters. It addresses comprehensively both RF design and digital implementation simultaneously, in order to design energy- and cost-efficient high-performance transmitters for mm-wave high-speed communications. It covers the complete design flow, from link budget assessment to the transistor-level design of different RF front-end blocks, such as mixers and power amplifiers, presenting different alternatives and discussing the existing trade-offs. The authors also analyze the effect of the imperfections of these blocks in the overall performance, while describing techniques to correct and compensate for them digitally. Well-known techniques are revisited, and some new ones are described, giving examples of their applications and proving them in real integrated circuits.

This book is a collection of high-quality peer-reviewed research papers presented at Sixth International Conference on Recent Trends in Computing (ICRTC 2020) held at SRM Institute of Science and Technology, Ghaziabad, Delhi, India, during 3 -4 July 2020. The book discusses a wide variety of industrial, engineering and scientific applications of the emerging techniques. The book presents original works

from researchers from academic and industry in the field of networking, security, big data and the Internet of things.

This volume of Advances in Intelligent Systems and Computing highlights key scientific achievements and innovations in all areas of automation, informatization, computer science, and artificial intelligence. It gathers papers presented at the IITI 2017, the Second International Conference on Intelligent Information Technologies for Industry, which was held in Varna, Bulgaria on September 14–16, 2017. The conference was jointly co-organized by Technical University of Varna (Bulgaria), Technical University of Sofia (Bulgaria), VSB Technical University of Ostrava (Czech Republic) and Rostov State Transport University (Russia). The IITI 2017 brought together international researchers and industrial practitioners interested in the development and implementation of modern technologies for automation, informatization, computer science, artificial intelligence, transport and power electrical engineering. In addition to advancing both fundamental research and innovative applications, the conference is intended to establish a new dissemination platform and an international network of researchers in these fields.

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