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High Mobility Materials for CMOS Applications provides a comprehensive overview of recent developments in the field of (Si)Ge

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and III-V materials and their integration on Si. The book covers material growth and integration on Si, going all the way from device to circuit design. While the book's focus is on digital applications, a number of chapters also address the use of III-V for RF and analog applications, and in

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optoelectronics. With CMOS technology moving to the 10nm node and beyond, however, severe concerns with power dissipation and performance are arising, hence the need for this timely work on the advantages and challenges of the technology. Addresses each of the

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challenges of utilizing high mobility materials for CMOS applications, presenting possible solutions and the latest innovations Covers the latest advances in research on heterogeneous integration, gate stack, device design and scalability Provides a broad overview of the topic, from

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materials integration to circuits
IEEE Instrumentation and
Measurement Technology Conference
Proceedings MOS Devices for Low-
Voltage and Low-Energy
Applications John Wiley & Sons
The ever-increasing need for higher
efficiency, smaller size, and lower cost

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make the analysis, understanding, and design of energy conversion systems extremely important, interesting, and even imperative. One of the most neglected features in the study of such systems is the effect of the inherent nonlinearities on the stability of the system. Due to these nonlinearities,

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these devices may exhibit undesirable and complex dynamics, which are the focus of many researchers. Even though a lot of research has taken place in this area during the last 20 years, it is still an active research topic for mainstream power engineers. This research has demonstrated that these

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systems can become unstable with a direct result in increased losses, extra subharmonics, and even uncontrollability/unobservability. The detailed study of these systems can help in the design of smaller, lighter, and less expensive converters that are particularly important in emerging

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areas of research like electric vehicles, smart grids, renewable energy sources, and others. The aim of this Special Issue is to cover control and nonlinear aspects of instabilities in different energy conversion systems: theoretical, analysis modelling, and practical solutions for such emerging

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applications. In this Special Issue, we present novel research works in different areas of the control and nonlinear dynamics of energy conversion systems.

A Guide to the Future of
Nanoelectronics
Silicon-on-Insulator (SOI)

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Select Proceedings of ICSC 2018
Advances in Signal Processing and
Communication
Regular papers & short notes. Part 1
Wireless World
Semiconductor Gas Sensors, Second
Edition, summarizes recent research on
basic principles, new materials and

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emerging technologies in this essential field. Chapters cover the foundation of the underlying principles and sensing mechanisms of gas sensors, include expanded content on gas sensing characteristics, such as response, sensitivity and cross-sensitivity, present an overview of the nanomaterials utilized for

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gas sensing, and review the latest applications for semiconductor gas sensors, including environmental monitoring, indoor monitoring, medical applications, CMOS integration and chemical warfare agents. This second edition has been completely updated, thus ensuring it reflects current literature and

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the latest materials systems and applications. Includes an overview of key applications, with new chapters on indoor monitoring and medical applications Reviews developments in gas sensors and sensing methods, including an expanded section on gas sensor theory Discusses the use of nanomaterials in gas sensing, with

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new chapters on single-layer graphene sensors, graphene oxide sensors, printed sensors, and much more

Helps readers understand the physics behind MOS devices for low-voltage and low-energy applications □ Based on timely published and unpublished work written by expert authors □ Discusses various

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promising MOS devices applicable to low-energy environmental and biomedical uses

- Describes the physical effects (quantum, tunneling) of MOS devices
- Demonstrates the performance of devices, helping readers to choose right devices applicable to an industrial or consumer environment
- Addresses some Ge-based devices and

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other compound-material-based devices for high-frequency applications and future development of high performance devices. 'Seemingly innocuous everyday devices such as smartphones, tablets and services such as on-line gaming or internet keyword searches consume vast amounts of energy. Even when in standby mode, all

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these devices consume energy. The upcoming "Internet of Things" (IoT) is expected to deploy 60 billion electronic devices spread out in our homes, cars and cities. Britain is already consuming up to 16 per cent of all its power through internet use and this rate is doubling every four years. According to The UK's Daily

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Mail May (2015), if usage rates continue, all of Britain's power supply could be consumed by internet use in just 20 years. In 2013, U.S. data centers consumed an estimated 91 billion kilowatt-hours of electricity, corresponding to the power generated by seventeen 1000-megawatt nuclear power plants. Data center

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electricity consumption is projected to increase to roughly 140 billion kilowatt-hours annually by 2020, the equivalent annual output of 50 nuclear power plants. (Natural Resources Defense Council, USA, Feb. 2015) All these examples stress the urgent need for developing electronic devices that consume as little energy as

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possible. The book "MOS Devices for Low-Voltage and Low-Energy Applications" explores the different transistor options that can be utilized to achieve that goal. It describes in detail the physics and performance of transistors that can be operated at low voltage and consume little power, such as subthreshold

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operation in bulk transistors, fully depleted SOI devices, tunnel FETs, multigate and gate-all-around MOSFETs. Examples of low-energy circuits making use of these devices are given as well. The book *□MOS Devices for Low-Voltage and Low-Energy Applications□* is a good reference for graduate students, researchers,

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semiconductor and electrical engineers who will design the electronic systems of tomorrow.' --- Dr. Jean-Pierre Colinge, Taiwan Semiconductor Manufacturing Company (TSMC) □The authors present a creative way to show how different MOS devices can be used for low-voltage and low-power applications. They start with

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Bulk MOSFET, following with SOI MOSFET, FinFET, gate-all-around MOSFET, Tunnel-FET and others. It is presented the physics behind the devices, models, simulations, experimental results and applications. This book is interesting for researchers, graduate and undergraduate students. The low-energy

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field is an important topic for integrated circuits in the future and none can stay out of this. □ --- Prof. Joao A. Martino, University of Sao Paulo, Brazil

A thoroughly revised third edition of this widely praised, bestselling textbook presents a comprehensive systems-level perspective of electric and hybrid vehicles

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with emphasis on technical aspects, mathematical relationships and basic design guidelines. The emerging technologies of electric vehicles require the dedication of current and future engineers, so the target audience for the book is the young professionals and students in engineering eager to learn

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about the area. The book is concise and clear, its mathematics are kept to a necessary minimum and it contains a well-balanced set of contents of the complex technology. Engineers of multiple disciplines can either get a broader overview or explore in depth a particular aspect of electric or hybrid vehicles.

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Additions in the third edition include simulation-based design analysis of electric and hybrid vehicles and their powertrain components, particularly that of traction inverters, electric machines and motor drives. The technology trends to incorporate wide bandgap power electronics and reduced rare-earth

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permanent magnet electric machines in the powertrain components have been highlighted. Charging stations are a critical component for the electric vehicle infrastructure, and hence, a chapter on vehicle interactions with the power grid has been added. Autonomous driving is another emerging technology, and a

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chapter is included describing the autonomous driving system architecture and the hardware and software needs for such systems. The platform has been set in this book for system-level simulations to develop models using various softwares used in academia and industry, such as MATLAB®/Simulink, PLECS, PSIM,

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Motor-CAD and Altair Flux. Examples and simulation results are provided in this edition using these software tools. The third edition is a timely revision and contribution to the field of electric vehicles that has reached recently notable markets in a more and more environmentally sensitive world.

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EUV, X-ray, and Gamma-ray
Instrumentation for Astronomy
Electrical & Electronics Abstracts
Midwest Symposium on Circuits and
Systems
Proceedings of ICCDN 2018
Three-dimensional Integrated Circuit
Design

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Semiconductor Gas Sensors

Issues for 1973- cover the entire
IEEE technical literature.

The book covers recent trends
in the field of devices, wireless
communication and networking.
It presents the outcomes of the

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International Conference in
Communication, Devices and
Networking (ICCDN 2018),
which was organized by the
Department of Electronics and
Communication Engineering,
Sikkim Manipal Institute of

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Technology, Sikkim, India on
2-3 June, 2018. Gathering
cutting-edge research papers
prepared by researchers,
engineers and industry
professionals, it will help young
and experienced scientists and

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developers alike to explore new perspectives, and offer them inspirations on addressing real-world problems in the field of electronics, communication, devices and networking.

Discover a fresh approach to

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efficient and insight-driven analog integrated circuit design in nanoscale-CMOS with this hands-on guide. Expert authors present a sizing methodology that employs SPICE-generated lookup tables, enabling close

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agreement between hand analysis and simulation. This enables the exploration of analog circuit tradeoffs using the g_m/I_D ratio as a central variable in script-based design flows, and eliminates time-

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consuming iterations in a circuit simulator. Supported by downloadable MATLAB code, and including over forty detailed worked examples, this book will provide professional analog circuit designers, researchers,

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and graduate students with the theoretical know-how and practical tools needed to acquire a systematic and re-use oriented design style for analog integrated circuits in modern CMOS.

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Unexamined Applications
ETAERE-2016
Conference Record
The Portland Hilton, Portland,
Oregon ; Educational Sessions,
the Westin Benson ; May 4-7,
1987

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Principles and Applications
Control and Nonlinear Dynamics
on Energy Conversion Systems

Learn the basic
properties and designs
of modern VLSI devices,
as well as the factors

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affecting performance,
with this thoroughly
updated second edition.
The first edition has
been widely adopted as a
standard textbook in
microelectronics in many

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major US universities
and worldwide. The
internationally renowned
authors highlight the
intricate
interdependencies and
subtle trade-offs

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between various
practically important
device parameters, and
provide an in-depth
discussion of device
scaling and scaling
limits of CMOS and

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bipolar devices.

Equations and parameters provided are checked continuously against the reality of silicon data, making the book equally useful in practical

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transistor design and in the classroom. Every chapter has been updated to include the latest developments, such as MOSFET scale length theory, high-field

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transport model and SiGe-
base bipolar devices.

The chips in present-day
cell phones already
contain billions of
sub-100-nanometer
transistors. By 2020,

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however, we will see systems-on-chips with trillions of 10-nanometer transistors. But this will be the end of the miniaturization, because

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yet smaller transistors,
containing just a few
control atoms, are
subject to statistical
fluctuations and thus no
longer useful. We also
need to worry about a

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potential energy crisis,
because in less than
five years from now,
with current chip
technology, the internet
alone would consume the
total global electrical

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power! This book presents a new, sustainable roadmap towards ultra-low-energy (femto-Joule), high-performance electronics. The focus is on the

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energy-efficiency of the various chip functions: sensing, processing, and communication, in a top-down spirit involving new architectures such as silicon brains, ultra-

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low-voltage circuits,
energy harvesting, and
3D silicon technologies.
Recognized world leaders
from industry and from
the research community
share their views of

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this nanoelectronics
future. They discuss,
among other things,
ubiquitous communication
based on mobile
companions, health and
care supported by

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autonomous implants and
by personal carebots,
safe and efficient
mobility assisted by co-
pilots equipped with
intelligent micro-
electromechanical

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systems, and internet-based education for a billion people from kindergarden to retirement. This book should help and interest all those who will have

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to make decisions
associated with future
electronics: students,
graduates, educators,
and researchers, as well
as managers, investors,
and policy makers.

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Introduction: Towards
Sustainable 2020
Nanoelectronics.- From
Microelectronics to
Nanoelectronics.- The
Future of Eight Chip
Technologies.-

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Analog-Digital

Interfaces.-

Interconnects and

Transceivers.-

Requirements and Markets

for Nanoelectronics.-

ITRS: The International

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Technology Roadmap for
Semiconductors.-
Nanolithography.- Power-
Efficient Design
Challenges.-
Superprocessors and
Supercomputers.- Towards

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Terabit Memories.- 3D
Integration for Wireless
Multimedia.- The Next-
Generation Mobile User-
Experience.- MEMS (Micro-
Electro-Mechanical
Systems) for Automotive

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and Consumer.- Vision
Sensors and Cameras.-
Digital Neural Networks
for New Media.- Retinal
Implants for Blind
Patients.- Silicon
Brains.- Energy

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Harvesting and Chip
Autonomy.- The Energy
Crisis.- The Extreme-
Technology Industry.-
Education and Research
for the Age of
Nanoelectronics.- 2020

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World with Chips.
Computer Structure and
Logic Pearson
Certification Team The
place to start your
computer career! Learn
about computers and

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networks from the ground
up! Learn about
computers and networks
from the ground up! Your
first step toward
certifications from
CompTIA, Microsoft, or

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Cisco... absolutely no
experience necessary!
Explains every part of
your computer and shows
how each part works
together Teaches simple
troubleshooting and

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repair techniques Packed
with real-world examples
and case studies Master
the basics and build
your strong foundation
for success! I/O: How
information gets into

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and out of computers
Motherboards and buses:
How your computer's
parts are connected CPU:
How your computer's
"brain" works—and how to
install and troubleshoot

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it Memory and storage:
The types you need and
how to install them
Bootup: How your
computer starts, what
can go wrong, and how to
fix it Operating

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systems: The basics of
Windows, Mac OS X, and
Linux Basic security:
Protecting your data,
connections, and
computer
Troubleshooting: The

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tools and methods every
good PC technician must
know Networks and the
Internet: How they work,
how they communicate,
and how to connect to
them Test your

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knowledge, gain
confidence, and succeed!
More than 150 questions,
with clear explanations
of every answer!

Blueprints for Data
Center Optimization

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CMOS VLSI Engineering
Proceedings of the IEEE
1987 Custom Integrated
Circuits Conference
Battery Management
Systems
Design Fundamentals

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Fundamentals of Modern
VLSI Devices

Silicon-On-Insulator (SOI) CMOS technology has been regarded as another major technology for VLSI in addition to bulk CMOS technology. Owing to the buried oxide structure,

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SOI technology offers superior CMOS devices with higher speed, high density, and reduced second order effects for deep-submicron low-voltage, low-power VLSI circuits applications. In addition to VLSI applications, and because of its outstanding properties, SOI

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technology has been used to realize communication circuits, microwave devices, BICMOS devices, and even fiber optics applications. CMOS VLSI Engineering: Silicon-On-Insulator addresses three key factors in engineering SOI CMOS VLSI - processing technology, device

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modelling, and circuit designs are all covered with their mutual interactions. Starting from the SOI CMOS processing technology and the SOI CMOS digital and analog circuits, behaviors of the SOI CMOS devices are presented, followed by a CAD program, ST-SPICE, which

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incorporates models for deep-submicron fully-depleted mesa-isolated SOI CMOS devices and special purpose SOI devices including polysilicon TFTs. CMOS VLSI Engineering: Silicon-On-Insulator is written for undergraduate senior students and first-year graduate

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students interested in CMOS VLSI. It will also be suitable for electrical engineering professionals interested in microelectronics.

Instrumentation and automatic control systems.

This book is a collection of selected peer-reviewed papers presented at the

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International Conference on Signal Processing and Communication (ICSC 2018). It covers current research and developments in the fields of communications, signal processing, VLSI circuits and systems, and embedded systems. The book offers in-depth discussions and analyses of

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latest problems across different sub-fields of signal processing and communications. The contents of this book will prove to be useful for students, researchers, and professionals working in electronics and electrical engineering, as well as other allied fields.

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Control Engineering

*August 28-29, 1989, Dearborn,
Michigan*

*Proceedings of the ... Biennial
University/Government/Industry
Microelectronics Symposium*

Designing Embedded Systems with

Page 83/140

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PIC Microcontrollers

Electronics World

Most of the recent texts on compact modeling are limited to a particular class of semiconductor devices and do not provide comprehensive coverage of the field. Having a

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single comprehensive reference for the compact models of most commonly used semiconductor devices (both active and passive) represents a significant advantage for the reader. Indeed, several kinds of semiconductor devices are

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routinely encountered in a single IC design or in a single modeling support group. Compact Modeling includes mostly the material that after several years of IC design applications has been found both theoretically sound and practically

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significant. Assigning the individual chapters to the groups responsible for the definitive work on the subject assures the highest possible degree of expertise on each of the covered models. This book is a compilation of

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research work in the interdisciplinary areas of electronics, communication, and computing. This book is specifically targeted at students, research scholars and academicians. The book covers the different

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approaches and techniques for specific applications, such as particle-swarm optimization, Otsu's function and harmony search optimization algorithm, triple gate silicon on insulator (SOI)MOSFET, micro-Raman and Fourier

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Transform Infrared Spectroscopy (FTIR) analysis, high-k dielectric gate oxide, spectrum sensing in cognitive radio, microstrip antenna, Ground-penetrating radar (GPR) with conducting surfaces, and digital image forgery detection. The

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contents of the book will be useful to academic and professional researchers alike.

Power Supply Cookbook, Second Edition provides an easy-to-follow, step-by-step design framework for a wide variety of power supplies.

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With this book, anyone with a basic knowledge of electronics can create a very complicated power supply design in less than one day. With the common industry design approaches presented in each section, this unique book allows the

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reader to design linear, switching, and quasi-resonant switching power supplies in an organized fashion. Formerly complicated design topics such as magnetics, feedback loop compensation design, and EMI/RFI control are all

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described in simple language and design steps. This book also details easy-to-modify design examples that provide the reader with a design template useful for creating a variety of power supplies. This newly revised edition is a practical,

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"start-to-finish" design reference. It is organized to allow both seasoned and inexperienced engineers to quickly find and apply the information they need. Features of the new edition include updated information on the design of the

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output stages, selecting the controller IC, and other functions associated with power supplies, such as: switching power supply control, synchronization of the power supply to an external source, input low voltage inhibitors, loss of

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power signals, output voltage shut-down, major current loops, and paralleling filter capacitors. It also offers coverage of waveshaping techniques, major loss reduction techniques, snubbers, and quasi-resonant converters. Guides

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engineers through a step-by-step design framework for a wide variety of power supplies, many of which can be designed in less than one day Provides easy-to-understand information about often complicated topics, making power supply design

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a much more accessible and
enjoyable process

Complementary Metal Oxide
Semiconductor

Principles, Techniques and
Applications

Compact Modeling

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Management Controls

Index to IEEE Publications

JJAP

Battery Management Systems -
Design by Modelling describes the
design of Battery Management
Systems (BMS) with the aid of

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simulation methods. The basic tasks of BMS are to ensure optimum use of the energy stored in the battery (pack) that powers a portable device and to prevent damage inflicted on the battery (pack). This becomes increasingly

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important due to the larger power consumption associated with added features to portable devices on the one hand and the demand for longer run times on the other hand. In addition to explaining the general principles of BMS tasks such as

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charging algorithms and State-of-Charge (SoC) indication methods, the book also covers real-life examples of BMS functionality of practical portable devices such as shavers and cellular phones. Simulations offer the advantage

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over measurements that less time is needed to gain knowledge of a battery's behaviour in interaction with other parts in a portable device under a wide variety of conditions. This knowledge can be used to improve the design of a BMS, even

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before a prototype of the portable device has been built. The battery is the central part of a BMS and good simulation models that can be used to improve the BMS design were previously unavailable.

Therefore, a large part of the book

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is devoted to the construction of simulation models for rechargeable batteries. With the aid of several illustrations it is shown that design improvements can indeed be realized with the presented battery models. Examples include an

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improved charging algorithm that was elaborated in simulations and verified in practice and a new SoC indication system that was developed showing promising results. The contents of Battery Management Systems - Design by

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Modelling is based on years of research performed at the Philips Research Laboratories. The combination of basic and detailed descriptions of battery behaviour both in chemical and electrical terms makes this book truly

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multidisciplinary. It can therefore be read both by people with an (electro)chemical and an electrical engineering background.

With vastly increased complexity and functionality in the "nanometer era" (i.e. hundreds of millions of

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transistors on one chip), increasing the performance of integrated circuits has become a challenging task. Connecting effectively (interconnect design) all of these chip elements has become the greatest determining factor in

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overall performance. 3-D integrated circuit design may offer the best solutions in the near future. This is the first book on 3-D integrated circuit design, covering all of the technological and design aspects of this emerging design paradigm,

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while proposing effective solutions to specific challenging problems concerning the design of 3-D integrated circuits. A handy, comprehensive reference or a practical design guide, this book provides a sound foundation for the

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design of 3-D integrated circuits. *
Demonstrates how to overcome
"interconnect bottleneck" with 3-D
integrated circuit design...leading
edge design techniques offer
solutions to problems
(performance/power

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consumption/price) faced by all circuit designers * The FIRST book on 3-D integrated circuit design...provides up-to-date information that is otherwise difficult to find * Focuses on design issues key to the product development

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cycle...good design plays a major role in exploiting the implementation flexibilities offered in the 3-D * Provides broad coverage of 3-D integrated circuit design, including interconnect prediction models, thermal

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management techniques, and timing optimization...offers practical view of designing 3-D circuits
Energy Efficient Servers: Blueprints for Data Center Optimization introduces engineers and IT professionals to the power

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management technologies and techniques used in energy efficient servers. The book includes a deep examination of different features used in processors, memory, interconnects, I/O devices, and other platform components. It

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outlines the power and performance impact of these features and the role firmware and software play in initialization and control. Using examples from cloud, HPC, and enterprise environments, the book demonstrates how various

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power management technologies are utilized across a range of server utilization. It teaches the reader how to monitor, analyze, and optimize their environment to best suit their needs. It shares optimization techniques used by

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data center administrators and system optimization experts at the world's most advanced data centers.

Patents Abstracts of Japan
IEEE Instrumentation and
Measurement Technology

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Conference Proceedings
Official Gazette of the United States
Patent and Trademark Office
MOS Devices for Low-Voltage and
Low-Energy Applications
Advances in Communication,
Devices and Networking

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Systematic Design of Analog
CMOS Circuits

**In this book,
Complementary Metal
Oxide Semiconductor (CMOS) devices are
extensively discussed. The**

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**topics encompass the
technology advancement in
the fabrication process of
metal oxide semiconductor
field effect transistors or
MOSFETs (which are the
fundamental building**

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**blocks of CMOS devices)
and the applications of
transistors in the present
and future eras. The book is
intended to provide
information on the latest
technology development of**

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**CMOS to researchers,
physicists, as well as
engineers working in the
field of semiconductor
transistor manufacturing
and design.**

Embedded Systems with

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**PIC Microcontrollers:
Principles and Applications**
is a hands-on introduction
to the principles and
practice of embedded
system design using the PIC
microcontroller. Packed

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with helpful examples and illustrations, the book provides an in-depth treatment of microcontroller design as well as programming in both assembly language

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and C, along with advanced topics such as techniques of connectivity and networking and real-time operating systems. In this one book students get all they need to know to be

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**highly proficient at
embedded systems design.
This text combines
embedded systems
principles with
applications, using
the 16F84A, 16F873A and**

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and software programming,**

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using both assembler and C. The book is accompanied by a companion website containing copies of all programs and software tools used in the text and a 'student' version of the C

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compiler. This textbook will be ideal for introductory courses and lab-based courses on embedded systems, microprocessors using the PIC microcontroller, as well as

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microcontrollers as examples of the wider PIC family. *Learn how to program in Assembler and C. *Work through sample designs and design ideas, including a robot in the

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