

2008 ASHRAE ENVIRONMENTAL GUIDELINES FOR DATACOM EQUIPMENT

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Encyclopedia Of Thermal Packaging, Set 2: Thermal Packaging Tools (A 4-volume Set) - 2014-10-23

Please click here for information on Set 1:

Thermal Packaging Techniques Thermal and mechanical packaging -- the enabling technologies for the physical implementation of electronic systems -- are responsible for much of

the progress in miniaturization, reliability, and functional density achieved by electronic, microelectronic, and nanoelectronic products during the past 50 years. The inherent inefficiency of electronic devices and their sensitivity to heat have placed thermal packaging on the critical path of nearly every product development effort in traditional, as well as emerging, electronic product categories. Successful thermal packaging is the key differentiator in electronic products, as diverse as supercomputers and cell phones, and continues to be of pivotal importance in the refinement of traditional products and in the development of products for new applications. The Encyclopedia of Thermal Packaging, compiled in four multi-volume sets (Set 1: Thermal Packaging Techniques, Set 2: Thermal Packaging Tools, Set 3: Thermal Packaging Applications, and Set 4: Thermal Packaging Configurations) will provide a comprehensive, one-stop treatment of the techniques, tools,

applications, and configurations of electronic thermal packaging. Each of the author-written sets presents the accumulated wisdom and shared perspectives of a few luminaries in the thermal management of electronics. Set 2: Thermal Packaging Tools The second set in the encyclopedia, Thermal Packaging Tools, includes volumes dedicated to thermal design of data centers, techniques and models for the design and optimization of heat sinks, the development and use of reduced-order “compact” thermal models of electronic components, a database of critical material thermal properties, and a comprehensive exploration of thermally-informed electronic design. The numerical and analytical techniques described in these volumes are among the primary tools used by thermal packaging practitioners and researchers to accelerate product and system development and achieve “correct by design” thermal packaging solutions. The four sets in the Encyclopedia of Thermal Packaging will provide the novice and

student with a complete reference for a quick ascent on the thermal packaging "learning curve," the practitioner with a validated set of techniques and tools to face every challenge, and researchers with a clear definition of the state-of-the-art and emerging needs to guide their future efforts. This encyclopedia will, thus, be of great interest to packaging engineers, electronic product development engineers, and product managers, as well as to researchers in thermal management of electronic and photonic components and systems, and most beneficial to undergraduate and graduate students studying mechanical, electrical, and electronic engineering. Foreword Foreword (English) (42 KB) Foreword (Japanese) (342 KB) Please click here for information on Set 1: Thermal Packaging Techniques Thermal and mechanical packaging -- the enabling technologies for the physical implementation of electronic systems -- are responsible for much of the progress in miniaturization, reliability, and functional

density achieved by electronic, microelectronic, and nanoelectronic products during the past 50 years. The inherent inefficiency of electronic devices and their sensitivity to heat have placed thermal packaging on the critical path of nearly e

Green IT For Dummies - Carol Baroudi
2009-04-03

Green technology is not only good for the environment; it's also good for your bottom line. If your organization is exploring ways to save energy and reduce environmental waste, Green IT For Dummies can help you get there. This guide is packed with cost-saving ways to make your company a leader in green technology. The book is also packed with case studies from organizations that have gone green, so you can benefit from their experience. You'll discover how to: Perform an energy audit to determine your present consumption and identify where to start greening Develop and roll out a green technology project Build support from

management and employees Use collaboration tools to limit the need for corporate travel Improve electronic document management Extend hardware life, reduce data center floor space, and improve efficiency Formalize best practices for green IT, understand your company's requirements, and design an infrastructure to meet them Make older desktops and lighting fixtures more efficient with a few small upgrades Lower costs with virtual meetings, teleconferences, and telecommuting options Reduce your organization's energy consumption You'll also learn what to beware of when developing your green plan, and get familiar with all the terms relating to green IT. Green IT For Dummies starts you on the road to saving money while you help save the planet.

Contemporary High Performance Computing -

Jeffrey S. Vetter 2017-11-23

HPC is used to solve a number of complex questions in computational and data-intensive

sciences. These questions include the simulation and modeling of physical phenomena, such as climate change, energy production, drug design, global security, and materials design; the analysis of large data sets such as those in genome sequencing, astronomical observation, and cybersecurity; and the intricate design of engineered products, such as airplanes and automobiles. This second volume of Contemporary High Performance Computing: From Petascale toward Exascale continues to document international HPC ecosystems, including the sponsors and sites that host them. Each chapter is punctuated with a site's flagship system and: Presents highlights of applications, workloads, and benchmarks Describes hardware architectures, system software, and programming systems Explores storage, visualization, and analytics Examines the data center/facility as well as system statistics Featuring pictures of buildings and systems in production, floorplans, and many block diagrams

and charts to illustrate system design and performance, *Contemporary High Performance Computing: From Petascale toward Exascale, Volume Two* delivers a detailed snapshot of the rich history of practice in modern HPC. This book provides a valuable reference for researchers in HPC and computational science.

Grow a Greener Data Center - Douglas Alger
2010

Presents design strategies, operational approaches, and technologies to help data centers improve energy efficiency and become eco-friendly.

International Conference on Digital Libraries (ICDL) 2013 - Shantanu Ganguly
2013-11-29

ICDL conferences are recognized one of the most important platforms in the world where noted experts share their experiences. Many DL experts have contributed thought-provoking papers in ICDL 2013. These important papers are reviewed and conceptualized into ICDL on

different areas of DL proceedings. The Proceedings have two volumes and has over 1100 pages.

[Handbook of Energy-Aware and Green Computing, Volume 2](#) - Ishfaq Ahmad
2013-01-31

This book provides basic and fundamental knowledge of various aspects of energy-aware computing at the component, software, and system level. It provides a broad range of topics dealing with power-, energy-, and temperature-related research areas for individuals from industry and academia.

[Evaluation and Decision Models with Multiple Criteria](#) - Raymond Bisdorff
2015-06-09

This book showcases a large variety of multiple criteria decision applications (MCDAs), presenting them in a coherent framework provided by the methodology chapters and the comments accompanying each case study. The chapters describing MCDAs invite the reader to experiment with MCDA methods and perhaps

develop new variants using data from these case studies or other cases they encounter, equipping them with a broader perception of real-world problems and how to overcome them with the help of MCDAs.

The Road to a Modern IT Factory - Ferri Abolhassan 2014-04-11

IT is currently going through one of its most critical phases of transformation. IT vendors and IT service organizations are revolutionizing their production and service processes, adopting industrial practices. It is only through the consistent transformation into factory-like structures that quality, effectiveness and efficiency can be increased. By integrating professional concepts and methods taken from the context of industrial production, it is possible to meet functional and qualitative requirements from the departments and therefore from the end user. On top of that this new paradigm enables the implementation of optimal processes in the organization. An interdisciplinary team of

authors addresses the current challenges for global IT services organizations and describes the process of IT industrialization. The transformation of the IT industry towards the model of an IT factory is the core theme of this book, which takes the latest findings from applied research, consulting and IT business practices and combines them into a consistent and innovative approach to IT services.

IT Infrastructure Architecture - Infrastructure Building Blocks and Concepts Third Edition - Sjaak Laan 2017-01-20

This book explains the concepts, history, and implementation of IT infrastructures. Although many of books can be found on each individual infrastructure building block, this is the first book to describe all of them: datacenters, servers, networks, storage, operating systems, and end user devices. The building blocks described in this book provide functionality, but they also provide the non-functional attributes performance, availability, and security. These

attributes are explained on a conceptual level in separate chapters, and specific in the chapters about each individual building block. Whether you need an introduction to infrastructure technologies, a refresher course, or a study guide for a computer science class, you will find that the presented building blocks and concepts provide a solid foundation for understanding the complexity of today's IT infrastructures. This book can be used as part of IT architecture courses based on the IS 2010.4 curriculum.

Handbook of Energy-Aware and Green Computing - Two Volume Set - Ishfaq Ahmad
2016-02-03

Implementing energy-efficient CPUs and peripherals as well as reducing resource consumption have become emerging trends in computing. As computers increase in speed and power, their energy issues become more and more prevalent. The need to develop and promote environmentally friendly computer technologies and systems has also come to the

forefront

Particulate and Gaseous Contamination in Datacom Environments - Ashrae 2014-06-19

"Provides information that is essential to the prevention and control of particulate and gaseous contamination within datacom facilities and gives a common set of guidelines for contamination prevention and control that can enhance datacom equipment reliability"--

Engineering Asset Management - Dimitris Kiritsis 2011-02-03

Engineering Asset Management discusses state-of-the-art trends and developments in the emerging field of engineering asset management as presented at the Fourth World Congress on Engineering Asset Management (WCEAM). It is an excellent reference for practitioners, researchers and students in the multidisciplinary field of asset management, covering such topics as asset condition monitoring and intelligent maintenance; asset data warehousing, data mining and fusion; asset performance and level-

of-service models; design and life-cycle integrity of physical assets; deterioration and preservation models for assets; education and training in asset management; engineering standards in asset management; fault diagnosis and prognostics; financial analysis methods for physical assets; human dimensions in integrated asset management; information quality management; information systems and knowledge management; intelligent sensors and devices; maintenance strategies in asset management; optimisation decisions in asset management; risk management in asset management; strategic asset management; and sustainability in asset management.

Communication Systems and Information

Technology - Ming Ma 2011-06-21

This volume includes extended and revised versions of a set of selected papers from the International Conference on Electric and Electronics (EEIC 2011) , held on June 20-22 , 2011, which is jointly organized by Nanchang

University, Springer, and IEEE IAS Nanchang Chapter. The objective of EEIC 2011 Volume 4 is to provide a major interdisciplinary forum for the presentation of new approaches from Communication Systems and Information Technology, to foster integration of the latest developments in scientific research. 137 related topic papers were selected into this volume. All the papers were reviewed by 2 program committee members and selected by the volume editor Prof. Ming Ma. We hope every participant can have a good opportunity to exchange their research ideas and results and to discuss the state of the art in the areas of the Communication Systems and Information Technology.

IT Infrastructure Architecture - Sjaak Laan 2011-11

For many decades, IT infrastructure has provided the foundation for successful application deployments. Yet, general knowledge of infrastructures is not widespread. Experience

shows that software developers, system administrators, and project managers usually have little knowledge of the large influence IT infrastructures have on the performance, availability and security of software applications. This book explains the concepts, history, and implementation of a robust and balanced IT infrastructure. Although many of books can be found on individual infrastructure building blocks, this is the first book to describe all of them: datacenters, servers, networks, storage, virtualization, operating systems, and end user devices. Whether you need an introduction to infrastructure technologies, a refresher course, or a study guide for a computer science class, you will find that the presented building blocks and concepts provide a solid foundation for understanding the complexity of today's IT infrastructures.

Data Center Handbook - Hwaiyu Geng

2014-12-01

Provides the fundamentals, technologies, and

best practices in designing, constructing and managing mission critical, energy efficient data centers Organizations in need of high-speed connectivity and nonstop systems operations depend upon data centers for a range of deployment solutions. A data center is a facility used to house computer systems and associated components, such as telecommunications and storage systems. It generally includes multiple power sources, redundant data communications connections, environmental controls (e.g., air conditioning, fire suppression) and security devices. With contributions from an international list of experts, The Data Center Handbook instructs readers to: Prepare strategic plan that includes location plan, site selection, roadmap and capacity planning Design and build "green" data centers, with mission critical and energy-efficient infrastructure Apply best practices to reduce energy consumption and carbon emissions Apply IT technologies such as cloud and virtualization Manage data centers in order

to sustain operations with minimum costs Prepare and practice disaster recovery and business continuity plan The book imparts essential knowledge needed to implement data center design and construction, apply IT technologies, and continually improve data center operations.

Thermofluid Modeling for Energy Efficiency Applications - M. Masud K. Khan 2015-09-01 Thermofluid Modeling for Sustainable Energy Applications provides a collection of the most recent, cutting-edge developments in the application of fluid mechanics modeling to energy systems and energy efficient technology. Each chapter introduces relevant theories alongside detailed, real-life case studies that demonstrate the value of thermofluid modeling and simulation as an integral part of the engineering process. Research problems and modeling solutions across a range of energy efficiency scenarios are presented by experts, helping users build a sustainable engineering

knowledge base. The text offers novel examples of the use of computation fluid dynamics in relation to hot topics, including passive air cooling and thermal storage. It is a valuable resource for academics, engineers, and students undertaking research in thermal engineering. Includes contributions from experts in energy efficiency modeling across a range of engineering fields Places thermofluid modeling and simulation at the center of engineering design and development, with theory supported by detailed, real-life case studies Features hot topics in energy and sustainability engineering, including thermal storage and passive air cooling Provides a valuable resource for academics, engineers, and students undertaking research in thermal engineering

Recovery Act: Federspiel Controls (now Vigilant) and State of California Department of General Services Data Center Energy Efficient Cooling Control Demonstration - Clifford Federspiel 2012

Cloud Control Systems - Magdi S. Mahmoud
2020-01-14

Cloud Control Systems: Analysis, Design and Estimation introduces readers to the basic definitions and various new developments in the growing field of cloud control systems (CCS). The book begins with an overview of cloud control systems (CCS) fundamentals, which will help beginners to better understand the depth and scope of the field. It then discusses current techniques and developments in CCS, including event-triggered cloud control, predictive cloud control, fault-tolerant and diagnosis cloud control, cloud estimation methods, and secure control/estimation under cyberattacks. This book benefits all researchers including professors, postgraduate students and engineers who are interested in modern control theory, robust control, multi-agents control. Offers insights into the innovative application of cloud computing principles to control and automation systems Provides an overview of cloud control systems

(CCS) fundamentals and introduces current techniques and developments in CCS Investigates distributed denial of service attacks, false data injection attacks, resilient design under cyberattacks, and safety assurance under stealthy cyberattacks

Liquid Cooling Guidelines for Datacom Equipment Centers - 2014-02-01

"Provides information on liquid cooling for datacom equipment centers. Concerned with energy efficiency"--

HVAC Design Manual for Hospitals and Clinics - Ashrae 2013

"Provides in-depth design recommendations and proven, cost effective, and reliable solutions for health care HVAC design that provide low maintenance cost and high reliability based on best practices from consulting and hospital engineers with decades of experience in the design, construction, and operation of health care facilities"--

Transmission, Distribution, and Renewable

Energy Generation Power Equipment - Bella H. Chudnovsky 2017-03-07

The revised edition presents, extends, and updates a thorough analysis of the factors that cause and accelerate the aging of conductive and insulating materials of which transmission and distribution electrical apparatus is made. New sections in the second edition summarize the issues of the aging, reliability, and safety of electrical apparatus, as well as supporting equipment in the field of generating renewable energy (solar, wind, tide, and wave power). When exposed to atmospheric corrosive gases and fluids, contaminants, high and low temperatures, vibrations, and other internal and external impacts, these systems deteriorate; eventually the ability of the apparatus to function properly is destroyed. In the modern world of "green energy", the equipment providing clean, electrical energy needs to be properly maintained in order to prevent premature failure. The book's purpose is to help

find the proper ways to slow down the aging of electrical apparatus, improve its performance, and extend the life of power generation, transmission, and distribution equipment.

Preventing Occupational Disease and Injury - Barry S. Levy 2005

Innovative Biosystems Engineering for Sustainable Agriculture, Forestry and Food Production - Antonio Coppola 2020-03-19

This book gathers the latest advances, innovations, and applications in the field of innovative biosystems engineering for sustainable agriculture, forestry and food production. Focusing on the challenges of implementing sustainability in various contexts in the fields of biosystems engineering, it shows how the research has addressed the sustainable use of renewable and non-renewable resources. It also presents possible solutions to help achieve sustainable production. The Mid-Term Conference of the Italian Association of

Agricultural Engineering (AIIA) is part of a series of conferences, seminars and meetings that the AIIA organizes, together with other public and private stakeholders, to promote the creation and dissemination of new knowledge in the sector. The contributions included in the book were selected by means of a rigorous peer-review process, and offer an extensive and multidisciplinary overview of interesting solutions in the field of innovative biosystems engineering for sustainable agriculture.

Advanced Concepts for Renewable Energy

Supply of Data Centres - Jaume Salom

2017-06-12

The rapid increase of cloud computing, high performance computing (HPC) and the vast growth in Internet and Social Media use have aroused the interest in energy consumption and the carbon footprint of Data Centres. Data Centres primarily contain electronic equipment used for data processing (servers), data storage (storage equipment), and communications

(network equipment). Collectively, this equipment processes, stores, and transmits digital information and is known as information technology (IT) equipment. Advanced Concepts for Renewable Energy Supply of Data Centres introduces a number of technical solutions for the supply of power and cooling energy into Data Centres with enhanced utilisation of renewable energy sources in order to achieve low energy Data Centres. Because of the high energy density nature of these unique infrastructures, it is essential to implement energy efficiency measures and reduce consumption before introducing any renewable energy source. A holistic approach is used with the objective of integrating many technical solutions such as management of the IT (Information Technology) load, efficient electrical supply to the IT systems, Low-Ex air-conditioning systems, interaction with district heating and cooling networks, re-use of heat, free cooling (air, seawater, groundwater),

optimal use of heat and cold storage, electrical storage and integration in smart grids. This book is therefore a catalogue of advanced technical concepts that could be integrated into Data Centres portfolio in order to increase the overall efficiency and the share of renewable energies in power and cooling supply. Based on dynamic energy models implemented in TRNSYS some concepts are deeply evaluated through yearly simulations. The results of the simulation are illustrated with Sankey charts, where the energy flows per year within the subsystems of each concept for a selected scenario are shown, and graphs showing the results of parametric analysis. A set of environmental metrics (as the non-renewable primary energy) and financial metrics (CAPEX and OPEX) as well of energy efficiency metrics like the well-known PUE, are described and used to evaluate the different technical concepts.

Consulting-specifying Engineer - 2009

[Design Considerations for Datacom Equipment Centers](#) - American Society of Heating, Refrigerating and Air-Conditioning Engineers 2009-01-01

The design of computer rooms and telecommunications facilities is different in fundamental ways from the design of facilities used primarily for human occupancy. ASHRAE has not, until now, published a basic reference text to provide an overview of the special design needs of datacom facilities. As the power density of datacom equipment continues to increase, this need has grown more severe. This book covers basic design considerations for data and communications equipment centers. The book is divided into two parts. Part I, Datacom Facility Basics, includes chapters on datacom design criteria (temperature, temperature rate of change, relative humidity, dew point, and filtration), HVAC load, computer room cooling (including both air and liquid cooling), and air distribution. Part II of the book, Other

Considerations, includes chapters on ancillary spaces (battery plants, emergency generator rooms, burn-in rooms and test labs, and spare parts rooms), contamination, acoustical noise emissions, structural and seismic design and testing, fire detection and suppression, commissioning, availability and redundancy, and energy efficiency. This book does not cover electrical or electronic systems design and distribution. The primary changes for this second edition center on the updated thermal envelope and relate to the recommended temperatures at the inlets of the equipment operating in datacom facilities. This book is the third in the ASHRAE Datacom Series, authored by ASHRAE Technical Committee 9.9, Mission Critical Facilities, Technology Spaces and Electronic Equipment. This series provides comprehensive treatment of datacom cooling and related subjects.

Thermal Guidelines for Data Processing Environments - 2012

"This third edition of Thermal Guidelines for Data Processing Environments breaks new ground through the addition of new data center classes enabling near full-time use of free cooling techniques in the vast majority of the world's climates"--

ICT Sustainability - Tom Worthington
2017-03-03

ICT Sustainability is about how to assess, and reduce, the carbon footprint and materials used with computers and telecommunications. These are the notes for an award winning on-line graduate course on strategies for reducing the environmental impact of computers and how to use the Internet to make business more energy efficient. These notes have been used for courses by the Australian Computer Society, Australian National University and Athabasca University (Canada). The book includes an extensive bibliography. Free open access courseware is available on-line to accompany this text. *The Official (ISC)2 Guide to the CCSP CBK* -

Adam Gordon 2016-05-16

Globally recognized and backed by the Cloud Security Alliance (CSA) and the (ISC)² the CCSP credential is the ideal way to match marketability and credibility to your cloud security skill set. The Official (ISC)² Guide to the CCSPSM CBK Second Edition is your ticket for expert insight through the 6 CCSP domains. You will find step-by-step guidance through real-life scenarios, illustrated examples, tables, best practices, and more. This Second Edition features clearer diagrams as well as refined explanations based on extensive expert feedback. Sample questions help you reinforce what you have learned and prepare smarter. Numerous illustrated examples and tables are included to demonstrate concepts, frameworks and real-life scenarios. The book offers step-by-step guidance through each of CCSP's domains, including best practices and techniques used by the world's most experienced practitioners. Developed by (ISC)², endorsed by the Cloud

Security Alliance® (CSA) and compiled and reviewed by cloud security experts across the world, this book brings together a global, thorough perspective. The Official (ISC)² Guide to the CCSP CBK should be utilized as your fundamental study tool in preparation for the CCSP exam and provides a comprehensive reference that will serve you for years to come.

Optimum Cooling of Data Centers - Jun Dai
2013-11-20

This book describes the use of free air cooling to improve the efficiency of, and cooling of, equipment for use in telecom infrastructures. Discussed at length is the cooling of communication installation rooms such as data centers or base stations, and this is intended as a valuable tool for the people designing and manufacturing key parts of communication networks. This book provides an introduction to current cooling methods used for energy reduction, and also compares present cooling methods in use in the field. The qualification

methods and standard reliability assessments are reviewed, and their inability to assess the risks of free air cooling is discussed. The method of identifying the risks associated with free air cooling on equipment performance and reliability is introduced. A novel method of assessment for free air cooling is also proposed that utilizes prognostics and health management (PHM). This book also: Describes how the implementation of free air cooling can save energy for cooling within the telecommunications infrastructure. Analyzes the potential risks and failures of mechanisms possible in the implementation of free air cooling, which benefits manufacturers and equipment designers. Presents prognostics-based assessments to identify and mitigate the risks of telecommunications equipment under free air cooling conditions, which can provide the early warning of equipment failures at operation stage without disturbing the data centers' service. Optimum Cooling for Data

Centers is an ideal book for researchers and engineers interested in designing and manufacturing equipment for use in telecom infrastructures.

Data Center Handbook - Hwaiyu Geng
2014-12-22

Provides the fundamentals, technologies, and best practices in designing, constructing and managing mission critical, energy efficient data centers Organizations in need of high-speed connectivity and nonstop systems operations depend upon data centers for a range of deployment solutions. A data center is a facility used to house computer systems and associated components, such as telecommunications and storage systems. It generally includes multiple power sources, redundant data communications connections, environmental controls (e.g., air conditioning, fire suppression) and security devices. With contributions from an international list of experts, The Data Center Handbook instructs readers to: Prepare strategic plan that

includes location plan, site selection, roadmap and capacity planning Design and build "green" data centers, with mission critical and energy-efficient infrastructure Apply best practices to reduce energy consumption and carbon emissions Apply IT technologies such as cloud and virtualization Manage data centers in order to sustain operations with minimum costs Prepare and practice disaster recovery and business continuity plan The book imparts essential knowledge needed to implement data center design and construction, apply IT technologies, and continually improve data center operations.

Cooling of Microelectronic and Nanoelectronic Equipment - Madhusudan Iyengar 2014-08-25

To celebrate Professor Avi Bar-Cohen's 65th birthday, this unique volume is a collection of recent advances and emerging research from various luminaries and experts in the field. Cutting-edge technologies and research related

to thermal management and thermal packaging of micro- and nanoelectronics are covered, including enhanced heat transfer, heat sinks, liquid cooling, phase change materials, synthetic jets, computational heat transfer, electronics reliability, 3D packaging, thermoelectrics, data centers, and solid state lighting. This book can be used by researchers and practitioners of thermal engineering to gain insight into next generation thermal packaging solutions. It is an excellent reference text for graduate-level courses in heat transfer and electronics packaging. Contents: A Review of Cooling Road Maps for 3D Chip Packages (Dereje Agonafer) Thermal Performance Mapping of Direct Liquid Cooled 3D Chip Stacks (Karl J L Geisler and Avram Bar-Cohen) Dynamic Thermal Management Considering Accurate Temperature-Leakage Interdependency (Bing Shi and Ankur Srivastava) Energy Reduction and Performance Maximization Through Improved Cooling (David Copeland) Optimal Choice of Heat

Sinks from an Industrial Point of View (Clemens J M Lasance) Synthetic Jets for Heat Transfer Augmentation in Microelectronics Systems (Mehmet Arik and Enes Tamdogan) Recent Advance in Thermoelectric Devices for Electronics Cooling (Peng Wang) Energy Efficient Solid-State Cooling for Hot Spot Removal (Kazuaki Yazawa, Andrei Fedorov, Yogendra Joshi and Ali Shakouri) An Overview of the Use of Phase Change Materials for the Thermal Management of Transient Portable Electronics: Benefits and Challenges (Amy S Fleischer) Estimation of Cooling Performance of Phase Change Material (PCM) Module (Masaru Ishizuka and Tomoyuki Hatakeyama) Optimization Under Uncertainty for Electronics Cooling Design (Karthik K Bodla, Jayathi Y Murthy and Suresh V Garimella) Hydrophilic CNT-Sintered Copper Composite Wick for Enhanced Cooling (Glen A Powell, Anuradha Bulusu, Justin A Weibel, Sungwon S Kim, Suresh V Garimella and

Timothy S Fisher) A Cabinet Level Thermal Test Vehicle to Evaluate Hybrid Double-Sided Cooling Schemes (Qihong Nie and Yogendra Joshi) Energy Efficiency and Reliability Risk Mitigation of Data Centers Through Prognostics and Health Management (Jun Dai, Michael Ohadi and Michael Pecht) Damage Pre-Cursors Based Assessment of Accrued Thermomechanical Damage and Remaining Useful Life in Field Deployed Electronics (Pradeep Lall, Mahendra Harsha, Kai Goebel and Jim Jones) Towards Embedded Cooling — Gen 3 Thermal Packaging Technology (Avram Bar-Cohen) Readership: Researchers, practitioners, and postgraduates in mechanical engineering, nanoelectronics, computer engineering, and electrical & electronic engineering. Keywords: Electronics Cooling; Electronics Packaging; Thermal Management; Thermal Sciences; Electronics Reliability; Thermoelectrics; Computational Heat Transfer; Liquid Cooling

Structural and Vibration Guidelines for Datacom Equipment Centers - 2007

"Provides basics for addressing the structural and vibration performance (resistance against wind, snow, and seismic assault) of datacom equipment centers, focusing on the facility (envelope, beams, columns, floor slabs, roof slabs), the building infrastructure (power, cooling, flooring, ceiling systems), and the datacom equipment (servers, storage, tape drives, racks, network equipment)"--Provided by publisher.

PUE - Amer Society of Heating 2013

"Simplifies the absorption and use of the PUE metric and allows executives to gain understanding of the concepts surrounding PUE, while providing application knowledge and resources to those implementing and reporting data center metrics"--

Das Green Datacenter: wenn Rechnen grün wird - Vitalij Warkentin 2014-12

Die vorliegende Untersuchung beschäftigt sich

damit, bestehende Messsysteme auf dem Markt zu finden und sie fachlich und wirtschaftlich zu bewerten, um somit der Branche eine geeignete Messgeräteübersicht qualifizierter Hersteller zu geben. Weiterhin sind durch den Einsatz eines Energieüberwachungssystems mögliche Optimierungslösungen im klimatechnischen Bereich beschrieben. Die Rahmenbedingungen dieser Untersuchung sind: 1. Analyse Darstellung im Rechenzentrum: Schilderung der Ist-Situation und Darstellung bereits vorhandener Einsparpotenziale 2. Managementsysteme der IT: a) Aufzeigen der Möglichkeiten zur Planung der IT-Verbrauchsleistung anhand von Konfigurationstools. Hierzu gehören die Genauigkeit der Lastsimulierung und die Zusammenstellung von Servern. b) Vorstellung der Energieüberwachungssysteme nach der möglichen Messstellenverteilung ab der Niederspannungsunterverteilung. Dabei sind die Messsysteme mit ihren Ausstattungsmerkmalen

zu beschreiben. c) Die meisten Server sind heute mit dem „Integrierten Systemmonitoring“ ausgestattet. Es sind Schnittstellen zum Informationsaustausch mit anderen Systemen des Rechenzentrums zu ermitteln und zu beschreiben. Weiterhin ist aufzuzeigen, wie die zur Verfügung stehenden Informationen weiterverarbeitet werden können. d) Konzeptdarstellung und Merkmalübersicht ausgewählter Management-Software. 3. Bewertung bestehender Messsysteme: Gegenüberstellung verschiedener Messsysteme unter Berücksichtigung klassischer Betreiberanforderungen und Betrachtung der Anschaffungskosten. 4. Lösung zur Optimierung des Energiebedarfs: Ausarbeiten und Beschreiben von

Energieoptimierungsmöglichkeiten in einem Rechenzentrum anhand eines bestehenden Energieüberwachungssystems aus klimatechnischer Sicht.

Green Technology Strategies - Tom

Worthington 2009

This book is about how to reduce carbon emissions and achieve other environmental benefits by using computers and telecommunications technology. It is designed to be used within an online course for professionals, using mentored and collaborative learning techniques.

Best Practices for Datacom Facility Energy Efficiency - American Society of Heating, Refrigerating and Air-Conditioning Engineers 2009-01-01

"The intent of this publication is to provide the reader with detailed information on the design of datacom facilities that will aid in minimizing the life-cycle cost to the client and to maximize energy efficiency in a facility to align with ASHRAE's stated direction to lead the advancement of sustainable building design and operations"--Provided by publisher.

High Density Data Centers - American Society of Heating, Refrigerating and Air-Conditioning

Engineers 2008

"Provides the reader a series of data center case studies and best practices that demonstrate how high density loads can be cooled using a number of different approaches and includes a breadth of data center ventilation schemes and shows how they are deployed to cool high density IT equipment"--Provided by publisher.

Smarter Data Centers: Achieving Greater Efficiency - Mike Ebbers 2011-10-21

As we move towards becoming a smarter planet and the world becomes more instrumented, interconnected, and intelligent, the demands for data center resources are increasing rapidly. Smaller and more densely packed servers providing greater amounts of computing power can substantially increase power and cooling needs, while growing data volumes necessitate larger storage and network bandwidth capacities. Environmental and regulatory requirements can introduce additional limits on carbon emissions and water consumption. To

satisfy these demands while keeping costs in check, our data centers need to be smarter as well. Comprehensive views of data center inventories, operational and environmental conditions, and consumption across multiple capacity types that span both facilities and IT are required. You can achieve greater efficiency using hardware, software, services, and design both in facilities and IT, but you need a comprehensive data center strategy to tie them together and thus obtain a complete picture of your data center environments. This IBM® Redpaper™ publication discusses important considerations when creating and implementing your smarter data center strategy. Notable techniques, best practices, and technological advances that can become critical components of success are included, along with methods for bringing them together to gain in-depth knowledge of data center operations. With such insight comes increased resiliency, rapid responsiveness, profitable access to detailed

analytics, and reliable planning for the future. Although not all-inclusive, this document provides a guide to getting started, points you to additional sources of information, and suggests ways IBM can partner with you in your pursuit of a smarter data center.

Energy Efficient Thermal Management of Data Centers - Yogendra Joshi 2012-03-23

Energy Efficient Thermal Management of Data Centers examines energy flow in today's data centers. Particular focus is given to the state-of-the-art thermal management and thermal design approaches now being implemented across the

multiple length scales involved. The impact of future trends in information technology hardware, and emerging software paradigms such as cloud computing and virtualization, on thermal management are also addressed. The book explores computational and experimental characterization approaches for determining temperature and air flow patterns within data centers. Thermodynamic analyses using the second law to improve energy efficiency are introduced and used in proposing improvements in cooling methodologies. Reduced-order modeling and robust multi-objective design of next generation data centers are discussed.