



Low temperature electronics [physics, devices, circuits, and applications /

Gutierrez-D., Edmundo A.

Deen, M. Jamal

Claeys, Cor L.

Academic Press,

c2001

Libros electrónicos

Monografía

Low Temperature Electronics: Physics, Devices, Circuits, and Applications summarizes the recent advances in cryoelectronics starting from the fundamentals in physics and semiconductor devices to electronic systems, hybrid superconductor-semiconductor technologies, photonic devices, cryocoolers and thermal management. Furthermore, this book provides an exploration of the currently available theory, research, and technologies related to cryoelectronics, including treatment of the solid state physical properties of the materials used in these systems. Current applications are found in infrared systems, satellite communications and medical equipment. There are opportunities to expand in newer fields such as wireless and mobile communications, computers, and measurement and scientific equipment. Low temperature operations can offer certain advantages such as higher operational speeds, lower power dissipation, shorter signal transmission times, higher semiconductor and metal thermal conductivities, and improved digital and analog circuit performance. The computer, telecommunication, and cellular phone market is pushing the semiconductor industry towards the development of very aggressive device and integrated circuit fabrication technologies. This is taking these technologies towards the physical miniaturization limit, where quantum effects and fabrication costs are becoming a technological and economical barrier for further development. In view of these limitations, operation of semiconductor devices and circuits at low temperature (cryogenic temperature) is studied in this book. * It is a book intended for a wide audience: students, scientists, technology development engineers, private companies, universities, etc. * It contains information which is for the first time available as an all-in-one source; Interdisciplinary material is arranged and made compatible in this book * It is a must as reference source

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Título: Low temperature electronics [Recurso electrónico] physics, devices, circuits, and applications [edited by] Edmundo A. Gutierrez-D., M. Jamal Deen, C. Claeys

Editorial: San Diego Academic Press c2001

Mención de serie: Elsevier Engineering Information Books on ScienceDirect

Bibliografía: Includes bibliographical references and index

Restricciones de acceso: Acceso restringido a miembros del Consorcio de Bibliotecas Universitarias de Andalucía

Detalles del sistema: Modo de acceso: World Wide Web

Fuente de adquisición directa: EIR ScienceDirect (M)

ISBN: 9780123106759 0123106753

Materia: Cryoelectronics Cryoélectronique

Autores: Gutierrez-D., Edmundo A. Deen, M. Jamal Claeys, Cor L.

Baratz Innovación Documental

- Gran Vía, 59 28013 Madrid
- (+34) 91 456 03 60
- informa@baratz.es