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Nota di contenuto	Preface. Preface to the First Edition. Introduction. DIODES I: RECTIFIERS. p-n Junction Diode. p-i-n Diode. Schottky-Barrier Diode. Planar-Doped-Barrier (PDB) Diode. Isotype Heterojunction. DIODES II: NEGATIVE RESISTANCE N-SHAPED. Tunnel Diode. Transferred-Electron Device (TED). Resonant-Tunneling Diode. Resonant-Interband-Tunneling (RIT) Diode. Single-Barrier Tunnel Diode. Single-Barrier Tunnel Diode. Single-Barrier Interband-Tunneling Diode. Real-Space-Transfer (RST) Diode. DIODES III: NEGATIVE RESISTANCE S-SHAPED. Metal-Insulator-Semiconductor Switch (MISS). Planar-Doped-Barrier (PDB) Switch. Amorphous Threshold Switch. Heterostructure Hot-Electron Diode (HHED). DIODES IV: NEGATIVE RESISTANCE TRANSIT-TIME. Impact-Ionization-Avalanche Transit-Time (IMPATT) Diode. Barrier-Injection Transit-Time (BARITT) Diode. RESISTIVE AND CAPACITIVE DEVICES. Resistor. Metal-Oxide-Semiconductor (MOS) Capacitor. Charge-Coupled Device (CCD). TRANSISTORS I: FIELD-EFFECT. Metal-Oxide-Semiconductor Field-Effect Transistor (MOSFET). Junction Field-Effect Transistor (JFET). Metal-Semiconductor Field-Effect Transistor (MESFET). Modulation-Doped Field-Effect Transistor

(MODFET). Permeable-Base Transistor. Static-Induction Transistor (SIT). Real-Space-Transfer (RST) Transistor. Planar-Doped Field-Effect Transistor. Surface-Tunnel Transistor. Lateral Resonant-Tunneling Field-Effect Transistor (LRTFET). Stark-Effect Transistor. Velocity-Modulation Transistor (VMT). TRANSISTOR II: POTENTIAL-EFFECT. Bipolar Transistor. Tunneling Hot-Electron-Transfer Amplifier (THETA). Metal-Base Transistor. Bipolar Inversion-Channel Field-Effect Transistor (BICFET). Tunnel-Emitter Transistor (TETRAN). Planar-Doped-Barrier (PDB) Transistor. Heterojunction Hot-Electron Transistor (HHET). Induced-Base Transistor. Resonant-Tunneling Bipolar Transistor (RTBT/RBT). Resonant-Tunneling Hot-Electron Transistor (RHET). Quantum-Well-Base Resonant-Tunneling Transistor (QWBRTT). Spin-Valve Transistor. NONVOLATILE MEMORIES. Floating-Gate Avalanche-Injection Metal-Oxide-Semiconductor (FAMOS) Transistor. Metal-Nitride-Oxide-Semiconductor (MNOS) Transistor. THYRISTORS AND POWER DEVICES. Silicon-Controlled Rectifier (SCR). Insulated-Gate Bipolar Transistor (IGBT). Static-Induction Thyristor (SIThy). Unijunction Transistor. PHOTONICS I: LIGHT SOURCES. Light-Emitting Diode (LED). Injection Laser. PHOTONICS II: PHOTODETECTORS. Photoconductor. p-i-n Photodiode. Schottky-Barrier Photodiode. Charge-Coupled Image Sensor (CCIS). Avalanche Photodiode (APD). Phototransistor. Metal-Smiconductor-Metal (MSM) Photodetector. Quantum-Well Infrared Photodetector (QWIP). Quantum-Dot Infrared Photodetector (QDIP). Blocked-Impurity-Band (BIB) Photodetector. Negative-Electron-Affinity (NEA) Photocathode. Photon-Drag Detector. PHOTONICS III: BISTABLE OPTICAL DEVICES. Self-Electrooptic-Effect Device (SEED). Bistable Etalon. PHOTONICS IV: OTHER DEVICES. Solar Cell. Electroabsorption Modulator. Thermistor. Hall Plate. Strain Gauge (Gage). Interdigital Transducer (IDT). Ion-Sensitive Field-Effect Transistor (ISFET). Appendix A: Selected Nonsemiconductor Devices. Appendix B: Physical Phenomena. Appendix C: General Applications of Device Groups. Appendix D: Physical Properties. Appendix E: Background Information. Index.

Sommario/riassunto

A definitive and up-to-date handbook of semiconductor devices Semiconductor devices, the basic components of integrated circuits, are responsible for the rapid growth of the electronics industry over the past fifty years. Because there is a growing need for faster and more complex systems for the information age, existing semiconductor devices are constantly being studied for improvement, and new ones are being continually invented. As a result, a large number of types and variations of devices are available in the literature. The Second Edition of this unique engineering guide continues to be the only available complete collection of semiconductor devices, identifying 74 major devices and more than 200 variations of these devices. As in the First Edition, the value of this text lies in its comprehensive, yet highly readable presentation and its easy-to-use format, making it suitable for a wide range of audiences. . Essential information is presented for a quick, balanced overview. Each chapter is designed to cover only one specific device, for easy and focused reference. Each device is discussed in detail, always including its history, its structure, its characteristics, and its applications The Second Edition has been significantly updated with eight new chapters, and the material rearranged to reflect recent developments in the field. As such, it remains an ideal reference source for graduate students who want a quick survey of the field, as well as for practitioners and researchers who need quick access to basic information, and a valuable pragmatic handbook for salespeople, lawyers, and anyone associated with the semiconductor industry.