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| Collana | Artech House nanoscale science and engineering series |
| Altri autori (Persone) | SwartzlanderEarl E O'NeillMaire |
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| Nota di bibliografia | Includes bibliographical references and index. |
| Nota di contenuto | Design of Semiconductor QCA Systems; Contents; Part I QCA Background; 1 Introduction ; 1.1 Motivation ; 1.2 Contributions ; 1.3 Book Outline; References ; 2 Quantum-dot Cellular Automata; 2.1 QCA Fundamentals ; 2.1.1 QCA Cells and Wires ; 2.1.2 QCA Basic Gates ; 2.1.3 QCA Wire Crossings ; 2.2 Physical Implementations of QCA ; 2.2.1 Metal-Island QCA ; 2.2.2 Semiconductor QCA ; 2.2.3 Molecular QCA ; 2.2.4 Magnetic QCA ; 2.3 Clocking Schemes ; 2.3.1 Typical Four-Phase Clocking ; 2.3.2 Clocking Floorplans ; 2.3.3 Clocking for Reversible Computing ; 2.4 Design and Simulation Tools. 2.4.1 QCADesigner 2.4.2 QCAPro ; 2.5 Research Into QCA Digital Design ; 2.5.1 Computer Arithmetic Circuits ; 2.5.2 Combinational Circuits ; 2.5.3 Latches and Sequential Circuits ; 2.5.4 Memory Design ; 2.5.5 General and Specific Processors ; 2.5.6 Design Methods and Design Automation ; 2.5.7 Testing, Defects and Faults ; 2.6 Basic Design Rules. |
| Sommario/riassunto | Integrated circuits have become smaller, cheaper, and more reliable and certainly have revolutionized the world of electronics. Integrated circuits are used in almost all electronic devices and systems, many of which, such as the Internet, computers, and mobile phones, have become essential parts of modern life and have changed the way we |

live. Quantum-dot cellular automata (QCA) provides a revolutionary approach to computing with device-to-device interactions. The design of a QCA circuit is radically different from a conventional digital design due to its unique characteristics at both the physical level and logic level. Research on both circuit architecture and device design is required for a profound understanding of QCA nanotechnologies. This detailed reference presents practical design aspects of QCA with an emphasis on developing real-world implementations.
