Record Nr. UNINA9910782562303321 Design and test of digital circuits by quantum-dot cellular automata // **Titolo** Fabrizio Lombardi, Jing Huang, editors Pubbl/distr/stampa Boston; ,: Northeastern University, , ©2008 [Piscatagay, New Jersey]:,: IEEE Xplore,, [2007] **ISBN** 1-5231-1706-0 1-59693-268-6 Descrizione fisica 1 online resource (380 p.) Altri autori (Persone) LombardiFabrizio <1955-> HuangJing <1970-> Disciplina 621.395 Soggetti Cellular automata Digital electronics - Design and construction Digital electronics - Testing Nanoelectronics Quantum computers Quantum dots Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Description based upon print version of record. Nota di bibliografia Includes bibliographical references and index. Design and Test of Digital Circuits byQuantum-Dot Cellular Automata; Nota di contenuto Contents; Preface; Chapter 1 Introduction 1; Chapter 2 Nano Devices and Architectures Overview 11: Chapter 3 QCA 37: Chapter 4 QCA Combinational Logic Design 69; Chapter 5 Logic-Level Testing and Defect Characterization 91; Chapter 6 Two-Dimensional Schemes for Clocking/Timing of QCA Circuits 143: Chapter 7 Tile-Based QCA Design 171; Chapter 8 Sequential Circuit Design in QCA 213; Chapter 9 QCA Memory 247; Chapter 10 Implementing Universal Logic in QCA 287; Chapter 11 QCA Model for Computing and Energy Analysis 305 Chapter 12 Fault Tolerance of Reversible QCA Circuits 327Chapter 13 Conclusion and Future Work 349; Appendix A Preliminary for QCA Mechanical Model 353: Appendix B Validation of Mechanical Model 357: Appendix C Energy Dissipation Analysis of Circuit Units 363; About the

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Sommario/riassunto

Probing both the science and the engineering involved, this one-of-a-kind resource reviews current microchip fabrication methods and architectures and discusses fundamentals of nanoscale design and DNA self-assembly. Moreover, the book surveys current limitations and challenges, and features detailed case studies of lightweight self-organizing computer architectures. This roadmap to DNA microchip synthesis is essential reading for all engineers and researchers involved in developing nanoscale computer structures, devices, and applications.