1.	Record Nr.	UNINA9910163008503321
	Titolo	Enabling the Internet of Things : From Integrated Circuits to Integrated Systems / / edited by Massimo Alioto
	Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2017
	ISBN	3-319-51482-2
	Edizione	[1st ed. 2017.]
	Descrizione fisica	1 online resource (XIV, 520 p. 476 illus., 388 illus. in color.)
	Disciplina	621.3815
	Soggetti	Electronic circuits Electrical engineering Computer communication systems Circuits and Systems Electronic Circuits and Devices Communications Engineering, Networks Computer Communication Networks
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di bibliografia	Includes bibliographical references.
	Nota di contenuto	1. IoT: Bird's Eye View, Megatrends and Perspectives -- 2. IoT Nodes: System-Level View -- 3. Ultra-Low-Power Digital Architectures for the Internet of Things -- 4. Near-Threshold Digital Circuits for Nearly-Minimum Energy Processing -- 5. Energy Efficient Volatile Memory Circuits for IoT Era -- 6. On-Chip Non-Volatile Memory for Ultra-Low Power Operation -- 7. On-Chip Non-Volatile STT-MRAM Memories for Zero-Standby Power -- 8. Security Down to the Hardware Level -- 9. Design Methodologies for IoT Systems on a Chip -- 10. Power Management Circuit Design for IoT Nodes -- 11. Energy Harvesting -- 12. Ultra-Low Power Analog Interfaces for IoT -- 13. Ultra-Low Power Analog-Digital Converters for IoT -- 14. Circuit Techniques for IoT-Enabling Short-Range ULP Radios -- 15. Battery Technologies for IoT -- 16. System Packaging And Assembly In IoT Nodes -- 17. An IPv6 Energy-Harvested WSN Demonstrator Compatible with Indoor Applications -- 18. Ferro-electric RAM Based Microcontrollers: Ultra-Low Power Intelligence for the Internet of Things.

Sommario/riassunto

This book offers the first comprehensive view on integrated circuit and system design for the Internet of Things (IoT), and in particular for the tiny nodes at its edge. The authors provide a fresh perspective on how the IoT will evolve based on recent and foreseeable trends in the semiconductor industry, highlighting the key challenges, as well as the opportunities for circuit and system innovation to address them. This book describes what the IoT really means from the design point of view, and how the constraints imposed by applications translate into integrated circuit requirements and design guidelines. Chapter contributions equally come from industry and academia. After providing a system perspective on IoT nodes, this book focuses on state-of-the-art design techniques for IoT applications, encompassing the fundamental sub-systems encountered in Systems on Chip for IoT: ultra-low power digital architectures and circuits low- and zero-leakage memories (including emerging technologies) circuits for hardware security and authentication System on Chip design methodologies on-chip power management and energy harvesting ultra-low power analog interfaces and analog-digital conversion short-range radios miniaturized battery technologies packaging and assembly of IoT integrated systems (on silicon and non-silicon substrates). As a common thread, all chapters conclude with prospective view on the foreseeable evolution of related technologies for IoT. The concepts developed throughout the book are exemplified by two IoT node system demonstrations from industry. The unique balance between breadth and depth of this book: enables expert readers quickly to develop an understanding of the specific challenges and state-of-the-art solutions for IoT, as well as their evolution in the foreseeable future provides non-experts with a comprehensive introduction to integrated circuit design for IoT, and serves as an excellent starting point for further learning, thanks to the broad coverage of topics and selected references makes it very well suited for practicing engineers and scientists working in the hardware and chip design for IoT, and as textbook for senior undergraduate, graduate and postgraduate students (familiar with analog and digital circuits).