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Nota di contenuto	PREFACE xi -- 1 CLOCK SIGNAL IN ELECTRONIC SYSTEMS 1 -- 1.1 The Significance of Clock Signal 1 -- 1.2 The Characteristics of Clock Signal 5 -- 1.3 Clock Signal Driving Digital System 18 -- 1.4 Clock Signal Driving Sampling System 24 -- 1.5 Extracting Clock Signal From Data: Clock Data Recovery 30 -- 1.6 Clock Usage in System-on-Chip 32 -- 1.7 Two Fields: Clock Generation and Clock Distribution 33 -- 2 CLOCK GENERATION: EXISTING FREQUENCY SYNTHESIS TECHNIQUES 37 -- 2.1 Direct Analog Frequency Synthesis 38 -- 2.2 Direct Digital Frequency Synthesis 39 -- 2.3 Indirect Method (Phase-Locked Loop Based) 41 -- 2.4 The Shared Goal: All Cycles Have Same Length-in-Time 51 -- 3 TIME-AVERAGE-FREQUENCY 53 -- 3.1 The Scale of Level and the Scale of Time 53 -- 3.2 What Is Frequency? 54 -- 3.3 Reinvestigating the Frequency Concept: the Birth of Time-Average-Frequency 56 -- 3.4 Time-Average-Frequency in Circuit Implementation 59 -- 3.5 Average Frequency, Time-Average-Frequency, and Fundamental Frequency 61 -- 3.6 The Need of a Theory 62 -- 3.7 The Summary: Why Do We Need

Sommario/riassunto

Introducing a new, pioneering approach to integrated circuit designNanometer Frequency Synthesis Beyond Phase-Locked Loop introduces an innovative new way of looking at frequency that promises to open new frontiers in modern integrated circuit (IC) design. While most books on frequency synthesis deal with the phase-locked loop (PLL), this book focuses on the clock signal. It revisits the concept of frequency, solves longstanding problems in on-chip clock generation, and presents a new time-based information processing approach for future chip design.Beginning with the basics, the book explains how clock signal is used in electronic applications and outlines the shortcomings of conventional frequency synthesis techniques for dealing with clock generation problems. It introduces the breakthrough concept of Time-Average-Frequency, presents the Flying-Adder circuit architecture for the implementation of this approach, and reveals a new circuit device, the Digital-to-Frequency Converter (DFC). Lastly, it builds upon these three key components to explain the use of time rather than level to represent information in signal processing. Provocative, inspiring, and chock-full of ideas for future innovations, the book features:. A new way of thinking about the fundamental concept of clock frequency. A new circuit architecture for frequency synthesis: the Flying-Adder direct period synthesis. A new electronic component: the Digital-to-Frequency Converter. A new information processing approach: time-based vs. level-based. Examples demonstrating the power of this technology to build better, cheaper, and faster systemsWritten with the intent of showing readers how to think outside the box, Nanometer Frequency Synthesis Beyond the Phase-Locked Loop is a must-have resource for IC design engineers and researchers as well as anyone who would like to be at the forefront of modern circuit design.