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Nota di contenuto	From Frequency to Time-Average-Frequency; Contents; Foreword; Preface; A Paradigm Shift; In Electrical World We Only Deal with Two Things: Level and Time; Internet of Things and the Clock; Clock Is Enabler for System-Level Innovation; What Is New on Clock? Flexibility versus Spectrum Purity; Clock Is Not PLL; It Is Much Bigger; "Jittery" Clock Is Not Necessarily a Bad Thing; The Power of Idea; Acknowledgment; 1 Importance of Clock Signal in Modern Microelectronic Systems; 1.1 Clock Technology: One of the Four Fundamental Technologies in IC Design 1.2 Clock Signal Generator: The Knowledge-and-Skill Gap between Its Creator and Its User 1.3 How Is Sense-of-Time Created in Electrical World?; 1.4 All Microelectronic Systems Are Frequency Driven; 1.5 A New Kid in Town: The Clock Architect; References; 2 Everything about the Clock; 2.1 Clock Generation; 2.2 Clock Distribution: Functional; 2.3 Clock Distribution: Physical; 2.4 Clock Usage: System Perspective; 2.5 Clock Usage: Electrical Perspective; 2.6 Clock Signal Quality; 2.7 Clock Network Power Consumption; References 3 A Different Way of Constructing a Clock Signal: Time-Average-Frequency 3.1 Motivation; 3.2 Clock is Trigger and Gatekeeper: Essence

of Stage-by-Stage Operation; 3.3 Time-Average-Frequency: Brief Review; 3.4 Circuit Architecture of Time-Average-Frequency Direct Period Synthesis; 3.5 The Two Long-Lasting Problems: Small Frequency Granularity and Fast Frequency Switching; 3.6 Time-Average-Frequency and "Jittery" Clock; 3.7 Frequency Switching and Waveform Establishment in TAF-DPS Clock Generator; 3.8 Allan Variance of TAF-DPS Clock Signal
3.9 Behavior of TAF clock Signal Under the Scope of Jitter
3.10 Spectrum of TAF Clock Signal; 3.11 Impact of Implementation Imperfection; References; 4 Time-Average-Frequency and Special Clocking Techniques: Gapped Clock, Stretchable Clock, and Pausible Clock; 4.1 Gapped Clock and Synchronous FIFO; 4.2 Stretchable Clock, Pausible Clock, and Asynchronous FIFO; 4.3 Time-Average-Frequency Operation of Gapped Clock, Stretchable Clock, and Pausible Clock; References; 5 Microelectronic System Design in the Field of Time-Average-Frequency: A Paradigm Shift
5.1 Digital Data Communication in the Field of Frequency
5.2 Data Transfer in Time-Average-Frequency Field: Transmitting Clock Available; 5.3 Data Transfer in Time-Average-Frequency Field: Clockless Transmission; 5.4 Clock Data Recovery in Time-Average-Frequency Field; 5.5 Network-on-Chip GALS Strategy in Time-Average-Frequency Field; 5.6 Network Time Synchronization in Time-Average-Frequency Field: Improved Time Granularity and Frequency Granularity; 5.7 Crystalless Reference and Time-Average-Frequency Driven VLSI System: Source for Frequency Reference

Sommario/riassunto

Written in a simple, easy to understand style, this book will teach PLL users how to use new clock technology in their work in order to create innovative applications. Investigates the clock frequency concept from a different perspective--at an application level. Teaches engineers to use this new clocking technology to create innovations in chip/system level, through real examples extracted from commercial products.
