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Sommario/riassunto

This book offers a timely practical design guide and comprehensive description of Sigma-Delta Modulators (Ms). With emphasis on the most important design issues and the multiple trade-offs involved in the whole design flow from specifications to chip implementation and characterization, it compiles the enormous number of technical and research works reported to date on the topic of Ms, and presents the results of such a compilation in a didactical, pedagogical, and intuitive style. Various design methodologies and practical considerations are described with a top-down approach, presenting from theoretical fundamentals, system-level design equations and behavioral models in MATLAB/SIMULINK, to circuit, transistor-level realization in Cadence Design FrameWork II, and physical implementation, chip prototyping and experimental characterization. Other key features: . a comprehensive and systematic description of M architectures from the basic operating principles to state-of-the-art advances in architectures and circuits, and considering both switched-capacitor and continuous-time circuit implementations. a detailed review of state-of-the-art M ICs, extracting statistical and empirical design guidelines, identifying trends, design challenges and solutions. case studies showing the different stages of the design flow of Ms. a complete description of SIMSIDES (SIMulink Sigma-Delta Simulator), a time-domain behavioral simulator for the high-level sizing and verification of Ms, implemented in MATLAB/SIMULINK. a number of electronic resources (available through a companion website) including practical examples using SIMSIDES, the statistical data used in the state-of-the-art survey, as well as many design examples and simulation test benches Using a pedagogical and intuitive approach, this is an essential guide for designers of mixed-signal circuits in nanometer CMOS. It doubly serves as a self-contained reference for researchers, designers and non-experienced engineers wanting to acquire an insight into

Ms and for undergraduate and graduate students in electronics engineering.
