1. Record Nr.   UNINA9910826636603321

   Autore   Rosa Josae M. de la

   Titolo   CMOS sigma-delta converters : practical design guide / / Josae M. de la
                        Rosa and Rocaio del Raio

   Pubbl/distr/stampa   Hoboken [New Jersey] : , : Wiley-Blackwell, , 2013
                        [Piscataqay, New Jersey] : , : IEEE Xplore, , [2013]

   ISBN   1-118-56843-5
                        1-299-27753-5
                        1-118-56922-9

   Edizione   [3rd ed.]

   Descrizione fisica   1 online resource (428 p.)

   Collana   Wiley - IEEE

   Disciplina   621.3815/9

   Soggetti   Metal oxide semiconductors, Complementary - Design and
                        construction

   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.

   Nota di contenuto   List of Abbreviations xvii -- Preface xxi -- Acknowledgements xxvii --
                        1 Introduction to Modulators: Basic Concepts and Fundamentals 1
                        -- 1.1 Basics of A/D Conversion 2 -- 1.2 Basics of Sigma-Delta
                        Modulators 8 -- 1.3 Classification of Modulators 15 -- 1.4 Single-
                        Loop Modulators 16 -- 1.5 Cascade Modulators 24 -- 1.6
                        Multibit Modulators 29 -- 1.7 Band-Pass Modulators 36 -- 1.8
                        Continuous-Time Modulators 41 -- 1.9 Summary 49 -- 2 Circuits
                        and Errors: Systematic Analysis and Practical Design Issues 54 -- 2.1
                        Nonidealities in Switched-Capacitor Modulators 55 -- 2.2 Finite
                        Amplifier Gain in SC-Ms 56 -- 2.3 Capacitor Mismatch in SC-Ms
                        60 -- 2.4 Integrator Settling Error in SC-Ms 62 -- 2.5 Circuit Noise
                        in SC-Ms 71 -- 2.6 Clock Jitter in SC-Ms 75 -- 2.7 Sources of
                        Distortion in SC-Ms 76 -- 2.8 Nonidealities in Continuous-Time
                        Modulators 80 -- 2.9 Clock Jitter in CT-Ms 81 -- 2.10 Excess Loop
                        Delay in CT-Ms 85 -- 2.11 Quantizer Metastability in CT-Ms 88
                        -- 2.12 Finite Amplifier Gain in CT-Ms 89 -- 2.13 Time-Constant
                        Error in CT-Ms 92 -- 2.14 Finite Integrator Dynamics in CT-Ms 94
                        -- 2.15 Circuit Noise in CT-Ms 95 -- 2.16 Sources of Distortion in
                        CT-Ms 97 -- 2.17 Case Study: High-Level Sizing of a M 99 --
                        2.18 Summary 107 -- 3 Behavioral Modeling and High-Level Simulation

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 benchesUsing 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.