

Preface

Analog integrated circuits encounter applications in signal amplification, filtering, data acquisition systems, sensor conditioning, biomedical implants, actuator conditioning, oscillators, mixers, and so on. Those applications are possible, thanks to the availability of a huge plethora of active devices/elements, and thanks to the appropriate exploitation of their electrical characteristics. For instance, active devices can be classified according to the kind of signal (voltage/current) and port characteristics. Some examples are: voltage operational amplifier, current operational amplifier, operational transconductance amplifier, operational transresistance amplifier, current conveyor, current differencing transconductance amplifier, and so on. In this manner, this book collects recent theories and design methods and applications of active devices/elements (working in voltage-, current-, and/or mixed-mode) and summarizes challenges imposed by the nanometer technology.

The book consists of 13 chapters focused on: analysis, design, and optimization of active devices; nullors, their bipolar and CMOS implementations and applications in analog circuit synthesis and design; current feedback op-amps, their variants, integratable implementations and applications in analog signal processing; generation of grounded capacitors minimum component oscillators; active filter design using a two-graph based transformation technique; analog baseband filter design considerations for wireless receivers; flexible nanometer CMOS low-noise amplifiers for the next-generation software-defined-radio, mobile systems; clocked nanometer CMOS comparators; low-power electronics for biomedical sensors; sensor conditioning circuits; steady-state simulation of mixed analog/digital circuits; variability-aware optimization of RF integrated inductors in nanometer-scale technologies; and a survey on the static and dynamic translinear paradigm.

The topics covered in this book are intended for people in academy and industry, as well as a key guidance for students and practitioners in the very wide field of analog integrated circuits.



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