This is the only comprehensive book in the market for engineers that covers the design of CMOS and bipolar analog integrated circuits. The fifth edition retains its completeness and updates the coverage of bipolar and CMOS circuits.

A thorough analysis of a new low-voltage bipolar operational amplifier has been added to Chapters 6, 7, 9, and 11.

Chapter 12 has been updated to include a fully differential folded cascode operational amplifier example. With its streamlined and up-to-date coverage, more engineers will turn to this resource to explore key concepts in the field.

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NEW TO EDITION

• Coverage of Bipolar 741 Op Amp: The coverage of the bipolar 741 op amp has been replaced with a low-voltage bipolar op amp, the NE5234, with rail-to-rail common-mode input range and almost rail-to-rail output swing.

• Use of SPICE: Extensive use of SPICE is included in this new edition. SPICE is used as an integral part of many problems and computer analysis is used as it is most commonly employed in the engineering design process -- both as a more accurate check on hand calculations, and also as a tool to examine complex circuit behavior beyond the scope of hand analysis.

FEATURES

• Coverage of cutting edge topics—more advanced CMOS device electronics to include short-channel effects, weak inversion and impact ionization.

• State-of-the-art IC processes that show students how modern integrated circuits are fabricated, including recent issues like heterojunction bipolar transistors, copper interconnect and low permittivity dielectric materials.

• Comprehensive and unified treatment of bipolar and CMOS circuits that helps students design real-world amplifiers in silicon.

• A number of open-ended design problems, included in the problem sets, exposes the reader to real-world situations where a range of circuit solutions may be found to satisfy a given performance specification.

• Extensive use of the SPICE computer analysis computer programs and is an integral part of many examples in the problem sets.

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