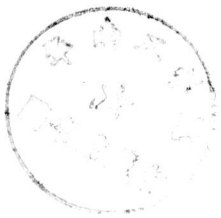
ELECTRONIC DESIGN WITH OFF-THE-SHELF INTEGRATED CIRCUITS

Second Edition



ELECTRONIC DESIGN WITH OFF-THE-SHELF INTEGRATED CIRCUITS

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Z. H. Meiksin

and

Philip C. Thackray

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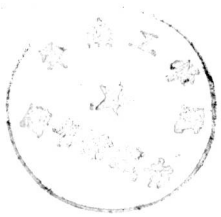
Dedication

To my wife Jeannine—
Z. H. Meiksin

In memory of my parents—
Philip C. Thackray



A Word from the Authors for the Second Edition

Developments in electronic design since the publication of the first edition of this book prompted us to expand the material in the book to ensure that you keep up with the state of the art. This additional material increases immeasurably the book's practical value in solving your design problems. This second edition of *Electronic Design with Off-the-Shelf Integrated Circuits,* like the first edition, shows you step by step how to design electronic systems with off-the-shelf ICs and how to select the right active and passive components. The second edition adds new material and further clarifies viable procedures throughout the book. The book has been broadened to include important developments that have occurred since the publication of the first edition. A large variety of analog switches, ranging from general purpose to special purpose switches, are being incorporated in electronic systems. The chapter on nonlinear applications has been expanded to include descriptions and applications of analog switches to show you how to select just the right IC switch, where to apply the appropriate voltages, and exactly how to connect the switches in ADA converters, sampling circuits, multiplexers, and other applications. The chapter on logic devices has been greatly expanded to include interfacing logic devices with displays and other devices.

As system design specifications are becoming more demanding, precise signal filtering is becoming even more important, requiring multiple stage filters beyond the fourth order. These demands can be met inexpensively with the readily available IC packages containing up to four op amps each. The chapter on filter design has been expanded to include so-called high-gain amplifier filters, and the sections on multistage filters have been extended from four-stage to ten-stage filters. All the information you need to design filters is given in simple formulas and tables, which make precision filter design straightforward and simple.

Another important development that has occurred since the publication of the first edition of this book is increased availability and mass supply of *microprocessor chips* at low cost. This development has made

Electronic Design with Off-the-Shelf Integrated Circuits even more valuable. Microprocessor chips in microprocessor-based equipment and microcomputers must be interfaced with the outside world to get information into and out of the microprocessor. To show you how to apply material in this book to design microprocessor interface circuits, a chapter has been added to the book. In this chapter we show you how input data and output data are interfaced with the microprocessor and microcomputer. We show you for example how you can design wave shaping interfaces to enter signals from temperature sensors and pressure transducers into microprocessor-based monitoring or control systems, and how you must synchronize the peripherals with the microprocessor or microcomputer.

This second edition of the book keeps you up with the state of the art of electronic design, and it gives you the information you need to keep pace with developing techniques for years to come.

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