All-Digital Frequency Synthesizer in Deep-Submicron CMOS

By Robert Bogdan Staszewski, Poras T. Balsara

All-Digital Frequency Synthesizer in Deep-Submicron CMOS By Robert Bogdan Staszewski, Poras T. Balsara

A new and innovative paradigm for RF frequency synthesis and wireless transmitter design

Learn the techniques for designing and implementing an all-digital RF frequency synthesizer. In contrast to traditional RF techniques, this innovative book sets forth digitally intensive design techniques that lead the way to the development of low-cost, low-power, and highly integrated circuits for RF functions in deep submicron CMOS processes. Furthermore, the authors demonstrate how the architecture enables readers to integrate an RF front-end with the digital back-end onto a single silicon die using standard ASIC design flow.

Taking a bottom-up approach that progressively builds skills and knowledge, the book begins with an introduction to basic concepts of frequency synthesis and then guides the reader through an all-digital RF frequency synthesizer design:

- Chapter 2 presents a digitally controlled oscillator (DCO), which is the foundation of a novel architecture, and introduces a time-domain model used for analysis and VHDL simulation
- Chapter 3 adds a hierarchical layer of arithmetic abstraction to the DCO that makes it easier to operate algorithmically
- Chapter 4 builds a phase correction mechanism around the DCO such that the system's frequency drift or wander performance matches that of the stable external frequency reference
- Chapter 5 presents an application of the all-digital RF synthesizer
- Chapter 6 describes the behavioral modeling and simulation methodology used in design

The final chapter presents the implementation of a full transmitter and experimental results. The novel ideas presented here have been implemented and proven in two high-volume, commercial single-chip radios developed at Texas Instruments: Bluetooth and GSM.

While the focus of the book is on RF frequency synthesizer design, the techniques can be applied to the design of other digitally assisted analog circuits

as well. This book is a must-read for students and engineers who want to learn a new paradigm for RF frequency synthesis and wireless transmitter design using digitally intensive design techniques.

All-Digital Frequency Synthesizer in Deep-Submicron CMOS

By Robert Bogdan Staszewski, Poras T. Balsara

All-Digital Frequency Synthesizer in Deep-Submicron CMOS By Robert Bogdan Staszewski, Poras T. Balsara

A new and innovative paradigm for RF frequency synthesis and wireless transmitter design

Learn the techniques for designing and implementing an all-digital RF frequency synthesizer. In contrast to traditional RF techniques, this innovative book sets forth digitally intensive design techniques that lead the way to the development of low-cost, low-power, and highly integrated circuits for RF functions in deep submicron CMOS processes. Furthermore, the authors demonstrate how the architecture enables readers to integrate an RF front-end with the digital back-end onto a single silicon die using standard ASIC design flow.

Taking a bottom-up approach that progressively builds skills and knowledge, the book begins with an introduction to basic concepts of frequency synthesis and then guides the reader through an all-digital RF frequency synthesizer design:

- Chapter 2 presents a digitally controlled oscillator (DCO), which is the foundation of a novel architecture, and introduces a time-domain model used for analysis and VHDL simulation
- Chapter 3 adds a hierarchical layer of arithmetic abstraction to the DCO that makes it easier to operate algorithmically
- Chapter 4 builds a phase correction mechanism around the DCO such that the system's frequency drift or wander performance matches that of the stable external frequency reference
- Chapter 5 presents an application of the all-digital RF synthesizer
- Chapter 6 describes the behavioral modeling and simulation methodology used in design

The final chapter presents the implementation of a full transmitter and experimental results. The novel ideas presented here have been implemented and proven in two high-volume, commercial single-chip radios developed at Texas Instruments: Bluetooth and GSM.

While the focus of the book is on RF frequency synthesizer design, the techniques can be applied to the design of other digitally assisted analog circuits as well. This book is a must-read for students and engineers who want to learn a new paradigm for RF frequency synthesis and wireless transmitter design using digitally intensive design techniques.

All-Digital Frequency Synthesizer in Deep-Submicron CMOS By Robert Bogdan Staszewski, Poras T. Balsara Bibliography

- Sales Rank: #2521527 in Books
- Published on: 2006-09-11
- Original language: English
- Number of items: 1
- Dimensions: 9.29" h x .97" w x 6.42" l, 1.28 pounds

- Binding: Hardcover
- 261 pages

Editorial Review

From the Back Cover

A new and innovative paradigm for RF frequency synthesis and wireless transmitter design

Learn the techniques for designing and implementing an all-digital RF frequency synthesizer. In contrast to traditional RF techniques, this innovative book sets forth digitally intensive design techniques that lead the way to the development of low-cost, low-power, and highly integrated circuits for RF functions in deep submicron CMOS processes. Furthermore, the authors demonstrate how the architecture enables readers to integrate an RF front-end with the digital back-end onto a single silicon die using standard ASIC design flow.

Taking a bottom-up approach that progressively builds skills and knowledge, the book begins with an introduction to basic concepts of frequency synthesis and then guides the reader through an all-digital RF frequency synthesizer design:

- Chapter 2 presents a digitally controlled oscillator (DCO), which is the foundation of a novel architecture, and introduces a time-domain model used for analysis and VHDL simulation
- Chapter 3 adds a hierarchical layer of arithmetic abstraction to the DCO that makes it easier to operate algorithmically
- Chapter 4 builds a phase correction mechanism around the DCO such that the system's frequency drift or wander performance matches that of the stable external frequency reference
- Chapter 5 presents an application of the all-digital RF synthesizer
- Chapter 6 describes the behavioral modeling and simulation methodology used in design

The final chapter presents the implementation of a full transmitter and experimental results. The novel ideas presented here have been implemented and proven in two high-volume, commercial single-chip radios developed at Texas Instruments: Bluetooth and GSM.

While the focus of the book is on RF frequency synthesizer design, the techniques can be applied to the design of other digitally assisted analog circuits as well. This book is a must-read for students and engineers who want to learn a new paradigm for RF frequency synthesis and wireless transmitter design using digitally intensive design techniques.

About the Author

ROBERT BOGDAN STASZEWSKI, PhD, is a Distinguished Member of Technical Staff with the Digital RF Processor Group of Texas Instruments, where he co-invented and developed the Digital RF Processor (DRPTM), a novel, all-digital transmitter and digitally intensive direct-sampling receiver architecture. Before joining Texas Instruments, Dr. Staszewski worked with Alcatel Network Systems as a design engineer.

PORAS T. BALSARA, PhD, is Professor of Electrical Engineering at the Erik Jonsson School of Engineering and Computer Science, The University of Texas at Dallas, where he teaches and conducts research in high-speed, low-power circuit design, VLSI circuits and architectures for signal processing and communication, and reconfigurable systems. He is also the Director of the University's Center for Integrated Circuits and Systems.

Users Review

From reader reviews:

Sarah Ford:

The guide with title All-Digital Frequency Synthesizer in Deep-Submicron CMOS has a lot of information that you can learn it. You can get a lot of help after read this book. This specific book exist new understanding the information that exist in this guide represented the condition of the world at this point. That is important to yo7u to find out how the improvement of the world. This book will bring you within new era of the the positive effect. You can read the e-book on your own smart phone, so you can read the item anywhere you want.

Josephine McIntire:

Your reading 6th sense will not betray anyone, why because this All-Digital Frequency Synthesizer in Deep-Submicron CMOS reserve written by well-known writer we are excited for well how to make book which might be understand by anyone who all read the book. Written within good manner for you, still dripping wet every ideas and writing skill only for eliminate your current hunger then you still skepticism All-Digital Frequency Synthesizer in Deep-Submicron CMOS as good book not only by the cover but also with the content. This is one reserve that can break don't evaluate book by its handle, so do you still needing yet another sixth sense to pick this specific!? Oh come on your reading through sixth sense already alerted you so why you have to listening to one more sixth sense.

William Nelson:

Beside this particular All-Digital Frequency Synthesizer in Deep-Submicron CMOS in your phone, it can give you a way to get nearer to the new knowledge or information. The information and the knowledge you might got here is fresh from oven so don't end up being worry if you feel like an previous people live in narrow small town. It is good thing to have All-Digital Frequency Synthesizer in Deep-Submicron CMOS because this book offers for you readable information. Do you occasionally have book but you seldom get what it's about. Oh come on, that will not end up to happen if you have this inside your hand. The Enjoyable set up here cannot be questionable, similar to treasuring beautiful island. Techniques you still want to miss this? Find this book as well as read it from today!

Juan Jensen:

With this era which is the greater person or who has ability to do something more are more special than other. Do you want to become certainly one of it? It is just simple strategy to have that. What you need to do is just spending your time not much but quite enough to get a look at some books. One of the books in the top checklist in your reading list is actually All-Digital Frequency Synthesizer in Deep-Submicron CMOS. This book that is certainly qualified as The Hungry Mountains can get you closer in getting precious person. By looking way up and review this reserve you can get many advantages.

Download and Read Online All-Digital Frequency Synthesizer in Deep-Submicron CMOS By Robert Bogdan Staszewski, Poras T. Balsara #S9WH30KPI5C

Read All-Digital Frequency Synthesizer in Deep-Submicron CMOS By Robert Bogdan Staszewski, Poras T. Balsara for online ebook

All-Digital Frequency Synthesizer in Deep-Submicron CMOS By Robert Bogdan Staszewski, Poras T. Balsara Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read All-Digital Frequency Synthesizer in Deep-Submicron CMOS By Robert Bogdan Staszewski, Poras T. Balsara books to read online.

Online All-Digital Frequency Synthesizer in Deep-Submicron CMOS By Robert Bogdan Staszewski, Poras T. Balsara ebook PDF download

All-Digital Frequency Synthesizer in Deep-Submicron CMOS By Robert Bogdan Staszewski, Poras T. Balsara Doc

All-Digital Frequency Synthesizer in Deep-Submicron CMOS By Robert Bogdan Staszewski, Poras T. Balsara Mobipocket

All-Digital Frequency Synthesizer in Deep-Submicron CMOS By Robert Bogdan Staszewski, Poras T. Balsara EPub

S9WH30KPI5C: All-Digital Frequency Synthesizer in Deep-Submicron CMOS By Robert Bogdan Staszewski, Poras T. Balsara