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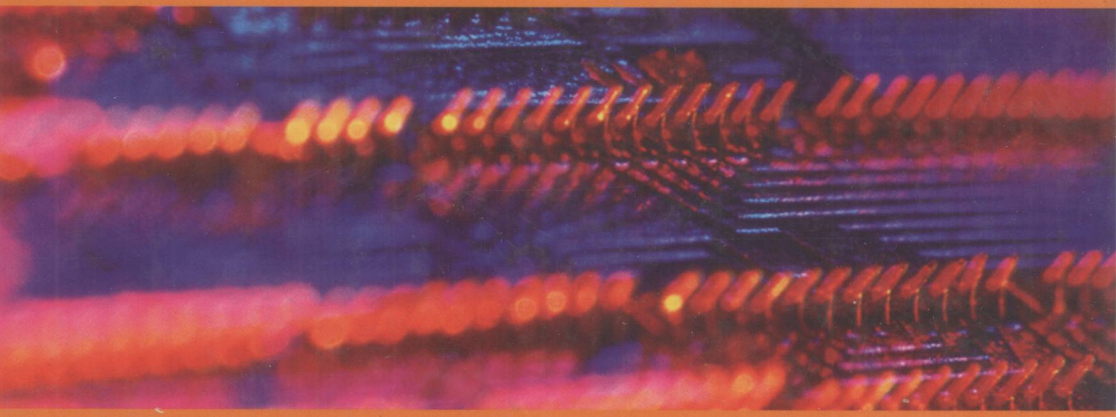

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Yichuang Sun

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Wireless communication circuits and systems

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To Xiaohui, Bo and Lucy

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Preface

This book is concerned with integrated circuits and systems for wireless and mobile communications. Circuit techniques and implementation of reconfigurable low-voltage and low-power single-chip CMOS transceivers for multiband and multi-mode universal wireless communications are the focus of the book. Applications encompass both long-range mobile cellular communications (GSM and UMTS) and short-range wireless LANs (IEEE802.11 and Bluetooth). Recent advances in research into transceiver architecture, RF frontend, analogue baseband, RF CAD and automatic testing are reported. The book, containing ten chapters, covers topics including receiver architectures, reconfigurable and programmable analogue base-band arrays, design and on-chip tuning of active IC filters including polyphase filters, receiver front-end modules (LNA, VCO, mixer) and chips, transmit power amplifiers, parasitic-aware RF design and optimisation, and on-chip testing of communication ICs. The book can be used as a text or reference book for a broad range of readers from both academia and industry.

I would like to thank Robin Mellors-Bourne, Director of the Publishing Department of the IEE for his support and encouragement. My gratitude also goes to David Haigh of UCL, IEE Circuits, Devices and Systems Series Editor, for his help, in particular with Chapter 1. Assistance from the editorial and production team at IEE is acknowledged. I am very grateful to the authors of the chapters for their great effort and high speed in contributing such high-quality chapters. Their professionalism is greatly appreciated. I should also thank my lovely family, Xiaohui, Bo and Lucy for their understanding and support.

During the preparation of this book, I was also Guest Editor of a special issue on 'RF circuits and systems for wireless communications' for *IEE Proceedings: Circuits, Devices and Systems* (published in December 2002). Some of the book chapter contributors have written papers for that special issue. I am pleased to see that some of the book chapters have benefited from the special issue.

Yichuang Sun

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Contents

Contributors xiii

Preface xvii

1 Wireless communications and transceivers: an overview 1
Yichuang Sun
1.1 Wireless and mobile communications 1
1.2 Integrated circuit technologies for wireless systems 2
1.3 Transceivers for wireless and mobile communications 2
1.4 Challenging topics in communication circuits and systems 3
1.4.1 Transceiver architecture and system-level design 3
1.4.2 RF, IF and analogue baseband circuits and subsystems 4
1.4.3 Design optimisation and automatic testing techniques 6
1.5 Summary of chapters 7

2 Non-complex signal processing in a low-IF receiver 9
Brian J. Minnis and Paul A. Moore
2.1 Introduction 9
2.2 Evolution of integrated receiver architectures 10
2.2.1 The conventional superhet architecture 10
2.2.2 The zero-IF architecture 11
2.2.3 Low-IF architecture 11
2.3 Digitising a conventional low-IF architecture 12
2.4 Performance requirements 13
2.5 Receiver dimensions 15
2.6 The change to non-complex signal processing 18
2.6.1 Polyphase image-rejection filter 21
2.6.2 Make-complex channel filter 23
2.6.3 $\Sigma\Delta$ modulator ADC 24
2.7 System simulations 27
2.8 Incorporation in a dual-mode receiver 30

2.9 Conclusions 32
2.10 References 32

3 A reconfigurable baseband chain for 3G wireless receivers 35
Md. Iqbal Younus, Anup Savla, Arun Ravindran and Mohammed Ismail
3.1 Introduction 35
3.2 Low-noise fully differential voltage buffer 35
3.2.1 Differential difference amplifier-based fully differential buffer 36
3.2.2 MOS realisation of a fully differential DDA 37
3.2.3 Wide-range low-noise FDB based on the DDA 38
3.2.4 Highly linear DDA-based filter section 40
3.2.5 Tuneable filter section 42
3.2.6 Variable gain amplifier 44
3.3 Reconfigurable baseband chain for 3G receivers 48
3.4 Conclusions 51
3.5 References 52

4 Field-programmable and reconfigurable analogue and mixed-signal arrays 53
Yichuang Sun and Rushikesh Lala
4.1 Introduction 53
4.2 Field-programmable analogue arrays (FPAA) 54
4.2.1 General architecture 54
4.2.2 Configurable analogue blocks (CABs) 56
4.2.3 CAD design procedure using FPAAs 56
4.2.4 General design issues for FPAA 57
4.2.5 Advanced circuit techniques for FPAA 58
4.2.6 FPAA applications 59
4.3 Commercial FPAA products 60
4.3.1 Lattice semiconductor's programmable analogue circuits (ispPAC) 60
4.3.2 Zetex semiconductor's TRAC (totally reconfigurable analogue circuit) 61
4.3.3 Anadigm field programmable analogue array (AN10E40) 63
4.4 Continuous-time CMOS OTA-C FPAA for high frequencies 64
4.4.1 Programmable OTA 64
4.4.2 Programmable capacitor array 65
4.4.3 Configurable analogue block using programmable OTAs and capacitors 65

4.4.4 Fine tuning of parameters 67
4.4.5 FPAA using CABs and its application in OTA-C filter design 68
4.5 FPMA and SoPC 71
4.5.1 FPMA 71
4.5.2 SoC and SoPC 72
4.5.3 Commercial mixed-signal SoPC: SIDSA FIPSOC 72
4.6 Reconfigurable universal transceivers using FPAAs 73
4.6.1 Universal transceivers for different standards 73
4.6.2 Reconfigurable transceivers using FPAA 73
4.7 Conclusions 75
4.8 References 76

5 A low-power, low-voltage Bluetooth channel filter using class AB CMOS transconductors 81
John Hughes, Adrian Spencer, Apisak Worapishet and Rungsimant Sitdhikorn
5.1 Introduction 81
5.2 Filter synthesis 82
5.2.1 Complex filters 82
5.2.2 Bluetooth filter synthesis 85
5.3 Class AB CMOS transconductor 86
5.3.1 Cell development 86
5.3.2 Frequency tuning 93
5.4 Filter design 95
5.5 Performance 97
5.6 Conclusions 103
5.7 References 103

6 Design and automatic tuning of integrated continuous-time filters 105
James Moritz and Yichuang Sun
6.1 Introduction 105
6.2 Filters in transceivers and the need for tuning 106
6.2.1 Filter requirements for wireless transceivers 106
6.2.2 The need for on-chip tuning 108
6.3 Filter architectures and design methods 109
6.3.1 Second-order cascade architecture 111
6.3.2 Multiple-loop feedback architecture 114
6.3.3 LC ladder simulation 115
6.3.4 OTA-C filters 118
6.3.5 MOSFET-C filters 122
6.3.6 Active-LC filters 126
6.3.7 Switched arrays for filter tuning 129

6.4 On-chip tuning of continuous-time filters 131
6.4.1 Frequency tuning and Q tuning 131
6.4.2 On-line and off-line tuning 134
6.4.3 Master–slave tuning 135
6.4.4 Frequency tuning methods 137
6.4.5 Q tuning techniques 141
6.4.6 Tuning of high-order leap-frog filters 142
6.5 Conclusions 145
6.6 References 147

7 Low-voltage integrated RF CMOS modules and frontend for 5 GHz and beyond 151
Mourad N. El-Gamal and Tommy K. Tsang
7.1 Introduction 151
7.2 A versatile low-voltage CMOS LNA topology 152
7.2.1 Single-transistor architecture 152
7.2.2 Conventional cascode LNA architecture 153
7.2.3 LC-coupled architecture 153
7.2.4 Folded cascode architecture 154
7.2.5 Gain control in the folded cascode structure 155
7.2.6 Frequency control in the folded cascode structure 157
7.2.7 Design equations and optimisation 157
7.2.8 Measurement results – stand-alone LNAs 160
7.3 A CMOS VCO architecture suitable for sub-1 volt GHz-range applications 168
7.3.1 The complementary differential LC structure 170
7.3.2 Proposed low-voltage VCO circuit architecture 172
7.3.3 VCO detailed circuitry and design guidelines 172
7.3.4 VCO experimental results 174
7.4 A very low-voltage (0.8 V) 5 GHz CMOS receiver frontend 179
7.4.1 The differential LNA 180
7.4.2 The mixer 181
7.4.3 The quadrature voltage-controlled oscillator 182
7.4.4 Measured characteristics of the receiver 183
7.5 Conclusions 186
7.6 References 187

8 Design of integrated CMOS power amplifiers for wireless transceivers 191
Mona M. Hella, Seoung-Jae Yoo and Mohammed Ismail
8.1 Introduction 191
8.2 Power amplifiers (PAs): concepts and challenges 192
8.2.1 Conjugate match and load-line match 193
8.2.2 Effect of the transistor knee (pinch-off) voltage 194

8.2.3 Classification of power amplifiers 195
8.2.4 Power amplifier linearisation 202
8.2.5 Spectral regrowth 207
8.3 Power amplifier controllability and stability 208
8.3.1 Power amplifier controllability 209
8.3.2 Power amplifier stability issues 209
8.4 Recent progress in RF CMOS PA design 210
8.5 Conclusions 212
8.6 References 212

9 Parasitic-aware RF IC design and optimisation 215
Kiyong Choi, Jinho Park and David J. Allstot
9.1 Introduction 215
9.2 On-chip inductor modelling 216
9.2.1 Spiral inductors 216
9.2.2 Bond wire inductor 217
9.3 Parasitic-aware optimisation 220
9.3.1 Simulated annealing 221
9.3.2 Adaptive simulated annealing 223
9.3.3 Post-PVT variation optimisation 229
9.3.4 Simulation results 229
9.4 RF circuit syntheses 231
9.4.1 Class-E power amplifier 232
9.4.2 Class-E power amplifier optimisation results 234
9.4.3 CMOS RF distributed amplifiers 237
9.4.4 Distributed amplifier optimisation results 239
9.5 Conclusions 239
9.6 References 242

10 Testing of RF, analogue and mixed-signal circuits for communications: an embedded approach 245
Mohamed M. Hafed and Gordon W. Roberts
10.1 Introduction 245
10.2 Some analogue performance metrics and test fundamentals 246
10.2.1 Linearity 247
10.2.2 Frequency response 248
10.2.3 Noise 249
10.2.4 Other performance metrics 250
10.3 Translating design specifications into production test programmes 250
10.4 The (diminishing) role of test equipment 252
10.4.1 Generic architecture of automatic test equipment 254
10.4.2 Signal delivery 255

10.5 Embedded mixed-signal test cores 255
10.5.1 Signal generation (circular memory A) 257
10.5.2 Signal digitisation (circular memory B and comparator) 259
10.5.3 Self-checking 261
10.6 Circuit considerations and instrument performance evaluation 262
10.6.1 Circuit considerations 263
10.6.2 Experimental evaluation 265
10.7 Measurement types and test examples 269
10.7.1 DC curve-tracer 269
10.7.2 Spectrum analyser 269
10.7.3 Oscilloscope 271
10.7.4 Jitter measurement device 275
10.8 Conclusions 276
10.9 References 277

Index **281**

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