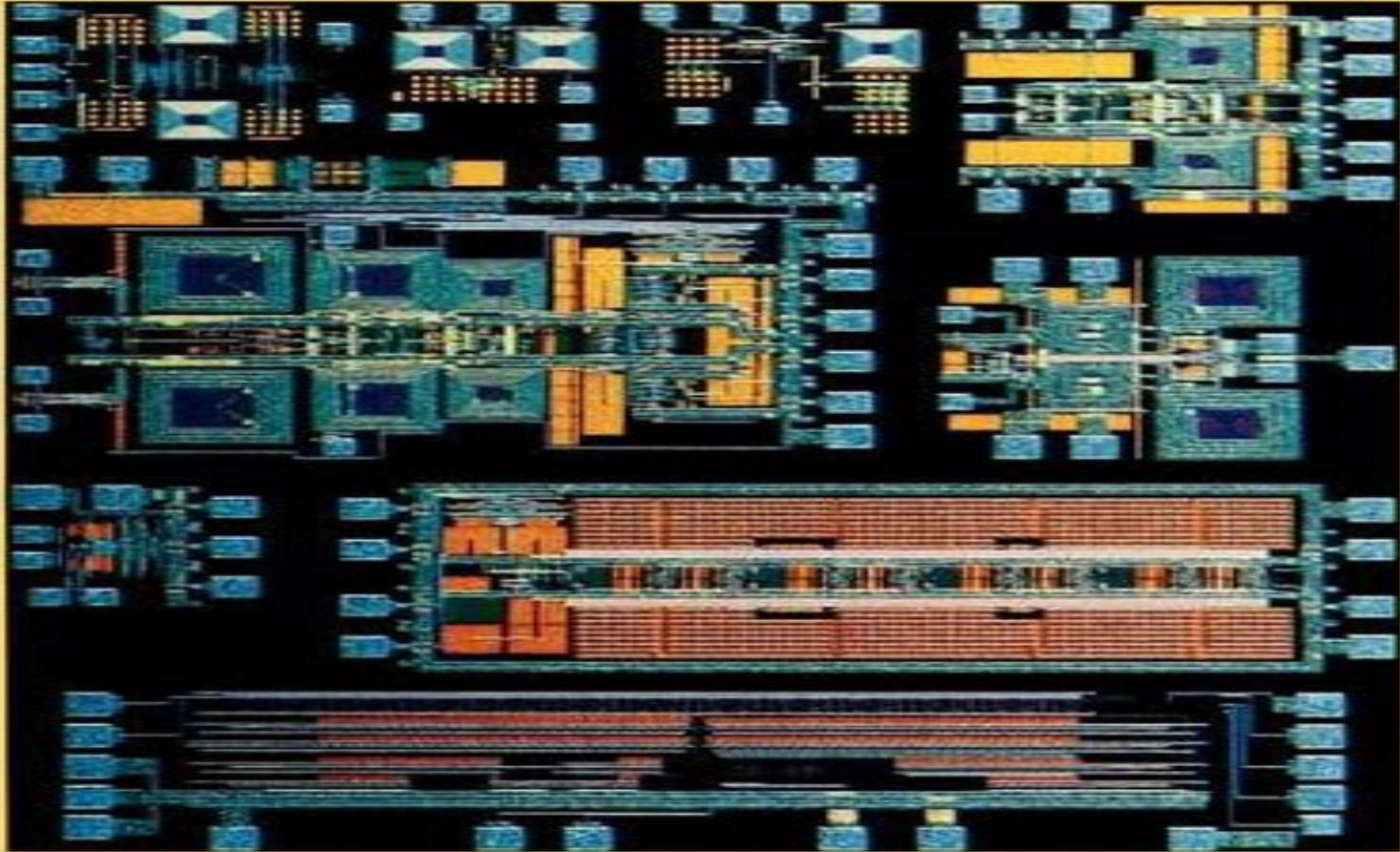


The Design and Implementation of

Low-Power CMOS Radio Receivers



Derek K. Shaeffer
Thomas H. Lee

Design And Implementation Of Low Power Cmos Radio Receivers

Mohammad Abdul Matin



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The Design and Implementation of Low-Power CMOS Radio Receivers Derek Shaeffer, Thomas H. Lee, 2007-05-08 It is hardly a profound observation to note that we remain in the midst of a wireless revolution In 1998 alone over 150 million cell phones were sold worldwide representing an astonishing 50% increase over the previous year Maintaining such a remarkable growth rate requires constant innovation to decrease cost while increasing performance and functionality Traditionally wireless products have depended on a mixture of semiconductor technologies spanning GaAs bipolar and BiCMOS just to name a few A question that has been hotly debated is whether CMOS could ever be suitable for RF applications However given the acknowledged inferiority of CMOS transistors relative to those in other candidate technologies it has been argued by many that CMOS RF is an oxymoron an endeavor best left cloistered in the ivory towers of academia In rebuttal there are several compelling reasons to consider CMOS for wireless applications Aside from the exponential device and density improvements delivered regularly by Moore's law only CMOS offers a technology path for integrating RF and digital elements potentially leading to exceptionally compact and low cost devices To enable this achievement several thorny issues need to be resolved Among these are the problem of poor passive components broadband noise in MOSFETs and phase noise in oscillators made with CMOS Beyond the component level there is also the important question of whether there are different architectural choices that one would make if CMOS were used given the different constraints

The Design and Implementation of Low-power CMOS Radio Receivers, 2002 The Design and Implementation of Low-Power CMOS Radio Receivers Derek

Shaeffer, Thomas H. Lee, 2014-01-15 *The Design and Implementation of Low-Power CMOS Radio Receivers* Derek Shaeffer, Thomas H Lee, 2013-03-21 It is hardly a profound observation to note that we remain in the midst of a wireless revolution In 1998 alone over 150 million cell phones were sold worldwide representing an astonishing 50% increase over the previous year Maintaining such a remarkable growth rate requires constant innovation to decrease cost while increasing performance and functionality Traditionally wireless products have depended on a mixture of semiconductor technologies spanning GaAs bipolar and BiCMOS just to name a few A question that has been hotly debated is whether CMOS could ever be suitable for RF applications However given the acknowledged inferiority of CMOS transistors relative to those in other candidate technologies it has been argued by many that CMOS RF is an oxymoron an endeavor best left cloistered in the ivory towers of academia In rebuttal there are several compelling reasons to consider CMOS for wireless applications Aside from the exponential device and density improvements delivered regularly by Moore's law only CMOS offers a technology path for integrating RF and digital elements potentially leading to exceptionally compact and low cost devices To enable this achievement several thorny issues need to be resolved Among these are the problem of poor passive components broadband noise in MOSFETs and phase noise in oscillators made with CMOS Beyond the component level there is also the important question of whether there are different architectural choices that one would make if CMOS were used given the different

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Ultra-Low Power Wireless Technologies for Sensor Networks Brian Otis, Jan Rabaey, 2007-02-24 transconductance efficiency of all critical devices in order to reduce the necessary bias current However reducing the current density also results in a severely decreased device f_T An optimization of the current density is required to provide the correct balance between transconductance efficiency and bandwidth Plots such as Figure 2.1 are useful tools for designers when choosing appropriate transistor bias points Technology scaling allows greatly increased f_T realization for a given IC Thus weak inversion biasing for RF f_T design will become increasingly useful in future technology nodes Throughout this work the IC of critical transistors will be discussed Most of the RF devices are biased in moderate to weak inversion to achieve enhanced transconductance efficiency and reduced bias current

2.2 MEMS Background The relatively new field of Radio Frequency Microelectro Mechanical Systems RF MEMS provides unique opportunities for RF transceiver designers This section provides background on RF MEMS and provides insight into the opportunities presented by these new technologies The field of RF MEMS includes the design and utilization of RF filters resonators switches and other passive mechanical structures constructed using bulk processed integrated circuit fabrication techniques To date these devices have been commercially used as discrete board mounted components primarily used to enhance the miniaturization of mobile phones However RF MEMS components have the potential to be batch fabricated using existing integrated circuit fabrication techniques

IEEE Transactions on Circuits and Systems, 2006

Frequency Translation Techniques for High-integration High-selectivity Multi-standard Wireless Communication Systems Jacques Christophe Rudell, 2000

A Design Methodology for Highly-integrated Low-power Receivers for Wireless Communications Dennis Gee-Wai Yee, 2001

Memorandum, 1982

Proceedings of the ... Biennial University/Government/Industry

Microelectronics Symposium , Proceedings of the ... ACM Great Lakes Symposium on VLSI ,2003 **Conference Proceedings** ,2003 American Book Publishing Record ,2000 **The British National Bibliography** Arthur James Wells,2003 **Annual Commencement** Stanford University,1996 *Ultra Wideband Communications* Mohammad Abdul Matin,2011-07-27 This book has addressed few challenges to ensure the success of UWB technologies and covers several research areas including UWB low cost transceiver low noise amplifier LNA ADC architectures UWB filter and high power UWB amplifiers It is believed that this book serves as a comprehensive reference for graduate students in UWB technologies
HBCUs/OMUs Research Conference Agenda and Abstracts ,2003

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