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Abbas Mohammadi and Fadhel M. Ghannouchi

RF Transceiver Design for MIMO Wireless Communications

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Authors
Prof. Abbas Mohammadi
Amirkabir University
Electrical Engineering Department
Tehran
Iran

Prof. Fadhel M. Ghannouchi
University of Calgary
Electrical and Computer Engineering
Intelligent RF Radio Laboratory
Alberta
Canada

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Preface

The multiple-input multiple-output (MIMO) technique provides higher bit rates and better reliability in wireless systems. The efficient design of RF transceivers has a vital impact on the implementation of this technique. This first book is completely devoted to RF transceiver design for MIMO communications. The book covers the most recent research in practical design and applications and can be an important resource for graduate students, wireless designers, and practical engineers.

The book opens with an introduction to MIMO wireless communications, where the main advantages of using MIMO technique are described. This is followed by a discussion on the implementation techniques for MIMO modulators. After describing the fundamental concepts for RF transceivers and power amplifiers, the design and analysis methods for the RF section of MIMO transmitters and receivers are presented. Furthermore, the RF impairments in MIMO and OFDM systems, including nonlinearity, phase noise, I/Q imbalance and DC offset, are discussed; and, their compensation methods are presented. Finally, the design techniques for single RF front-end MIMO systems are described.

Audience

The book can be used by graduate students, researchers and design engineers in microwave and wireless design areas. It is assumed that the reader has a fundamental knowledge of communication circuit design and communication systems theory. The book may be used as a textbook for a graduate course on wireless transceiver design techniques.

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