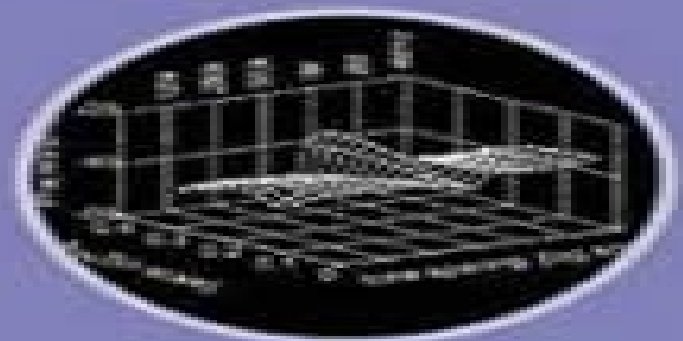


DISTORTION IN RF POWER AMPLIFIERS



Timo Bahkonen

Joel Vuolevi



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Jingchang Nan, Mingming Gao



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Distortion in RF Power Amplifiers Joel Vuolevi, Timo Rahkonen, 2003 Here is a thorough treatment of distortion in RF power amplifiers This unique resource offers expert guidance in designing easily linearizable systems that have low memory effects It offers you a detailed understanding of how the matching impedances of a power amplifier and other RF circuits can be tuned to minimize overall distortion What's more you see how to build models that can be used for distortion simulations

A Volterra Approach to Digital Predistortion Carlos Crespo Cadenas, Maria Jose Madero Ayora, Juan A. Becerra, 2025-01-15 Thorough discussion of the theory and application of the Volterra series for impairments compensation in RF circuits and systems A Volterra Approach to Digital Predistortion Sparse Identification and Estimation offers a comprehensive treatment of the Volterra series approach as a practical tool for the behavioral modeling and linearization of nonlinear wireless communication systems Although several perspectives can be considered when analyzing nonlinear effects this book focuses on the Volterra series to study systems with real valued continuous time RF signals as well as complex valued discrete time baseband signals in the digital signal processing field A unified framework provides the reader with in depth understanding of the available Volterra based behavioral models in particular the book emphasizes those models derived by exploiting the knowledge of the physical phenomena that produce different types of nonlinear distortion From these distinctive standpoints this work remarkably contributes to theoretical issues of behavioral modeling The book contributes to practical state of the art questions on linearization granting the reader practical guidance in designing digital predistortion schemes and adopting up to date machine learning methods to exploit the sparsity of the identification problem and reducing computational complexity Later chapters include information on Identification of Volterra based models as a linear regression problem allowing the adoption of sparse machine learning methods to reduce computational complexity while keeping rich model structures Deduction of Volterra models based on circuit model knowledge offering pruned model structures that are better fitted for specific scenarios Wireless communication systems and the nonlinear effects produced by power amplifiers mixers frequency converters or IQ modulators Digital predistortion schemes and experimental results for both indirect and direct learning architectures A Volterra Approach to Digital Predistortion Sparse Identification and Estimation is an essential reference on the subject for engineers and technicians who develop new products for the linearization of wireless transmitters as well as researchers and students in fields and programs of study related to wireless communications

Behavioral Modeling and Linearization of RF Power Amplifiers John Wood, 2014-06-01 Wireless voice and data communications have made great improvements with connectivity now virtually ubiquitous Users are demanding essentially perfect transmission and reception of voice and data The infrastructure that supports this wide connectivity and nearly error free delivery of information is complex costly and continually being improved This resource describes the mathematical methods and practical implementations of linearization techniques for RF power amplifiers for mobile

communications This includes a review of RF power amplifier design for high efficiency operation Readers are also provided with mathematical approaches to modeling nonlinear dynamical systems which can be applied in the context of modeling the PA for identification in a pre distortion system This book also describes typical approaches to linearization and digital pre distortion that are used in practice **Solid-state Microwave High-power Amplifiers** Franco Sechi, Marina Bujatti, 2009 This practical resource offers expert guidance on the most critical aspects of microwave power amplifier design This comprehensive book provides descriptions of all the major active devices discusses large signal characterization explains all the key circuit design procedures Moreover you gain keen insight on the link between design parameters and technological implementation helping you achieve optimal solutions with the most efficient utilization of available technologies The book covers a broad range of essential topics from requirements for high power amplifiers device models phase noise and power combiners to high efficiency amplifiers linear amplifier design bias circuits and thermal design **Essentials of RF and Microwave Grounding** Eric Holzman, 2006 Supported with more than 174 illustrations and utilizing simple derivations and results from numerical electromagnetic simulations of real components this single resource provides broad intuitive know how that helps practitioners overcome design challenges with speed and confidence Jacket **Nonlinear Modeling Analysis and Predistortion Algorithm Research of Radio Frequency Power Amplifiers** Jingchang Nan, Mingming Gao, 2021-07-29 This book is a summary of a series of achievements made by the authors and colleagues in the areas of radio frequency power amplifier modeling including neural Volterra series modeling neural network modeling X parameter modeling nonlinear analysis methods and power amplifier predistortion technology over the past 10 years The book is organized into ten chapters which respectively describe an overview of research of power amplifier behavioral models and predistortion technology nonlinear characteristics of power amplifiers power amplifier behavioral models and the basis of nonlinear analysis an overview of power amplifier predistortion Volterra series modeling of power amplifiers power amplifier modeling based on neural networks power amplifier modeling with X parameters the modeling of other power amplifiers nonlinear circuit analysis methods and predistortion algorithms and applications Blending theory with analysis this book will provide researchers and RF microwave engineering students with a valuable resource **Design of RF and Microwave Amplifiers and Oscillators** Pieter L. D. Abrie, 2009 This newly revised edition offers a comprehensive and current treatment of the subject and includes expanded derivations and problem sets helping to make the material even more accessible and easier to master **Classic Works in RF Engineering** John L. B. Walker, 2006 The growing interest in commercial RF applications and high frequency engineering has triggered a scramble for fundamental design and analysis information This expertly compiled resource gives microwave engineers instant one stop access to a vast range of essential source material in a single convenient volume **Fundamentals of Nonlinear Behavioral Modeling for RF and Microwave Design** John Wood, David E. Root, 2005 A revised collection of groundbreaking presentations made at a recent IMS International

Microwave Symposium workshop this cutting edge resource provides a comprehensive treatment of nonlinear behavioral modeling for RF and microwave circuits and systems from renowned experts in the field Presenting state of the art RF and microwave applications this practical book gives you hands on techniques that you can use immediately on your current projects

Modern Microwave Circuits Noyan Kinayman, M. I. Aksun, 2005 A single source reference on the modern microwave engineering and practical applications of microstrip circuit technology this invaluable book explains how microstrip circuits are built and provides in depth coverage of computer aided simulation and underlying theories Including over 450 equations and more than 200 illustrations it places special emphasis on working examples and full wave electromagnetic simulations You find detailed discussions on such critical topics as microwave passive lumped circuits filter design and calibration techniques The book gives you a thorough understanding of filter networks by explaining the key role of network synthesis

Noise in Linear and Nonlinear Circuits Stephen A. Maas, 2005 Overcome the effects of noise to push the level of circuit performance with this practical reference Thoroughly explaining the theory of noise in high frequency circuits the book focuses on the real world problems noise creates It provides you with a full understanding of methods for analyzing and minimizing noise in linear and nonlinear circuits The book pays special attention to phase noise in oscillators offering you a comprehensive and accessible treatment of this critical topic Additionally this authoritative volume examines noise in low noise amplifiers mixers and frequency multipliers

Microwave Differential Circuit Design Using Mixed-mode S-parameters William Richard Eisenstadt, Robert Stengel, Bruce M. Thompson, 2006 Gain hands on understanding of powerful new mixed mode scattering parameter techniques and their applications in microwave circuit design straight from the inventors of the techniques themselves This groundbreaking resource uses the original research and application work in the field to describe mixed mode S parameter principles Supported with over 150 illustrations the book thoroughly explains practical techniques that help you more effectively analyze differential and multi port systems measure and describe multi port circuit performance and conduct differential circuit analyses for isolation crosstalk stability noise reduction and balance

Integrated Circuit Design for High-speed Frequency Synthesis John W. M. Rogers, Calvin Plett, Foster Dai, 2006 Get hands on expertise in the design of frequency synthesizers in high speed integrated circuits with this complete one stop resource packed with straight from the lab techniques procedures and applications It delivers a definitive introduction to system architecture and behavioral analysis Moreover you find detailed circuit implementation guidance for state of the art synthesizer designs emphasizing phase locked loop based analog synthesizers and direct digital synthesizers and their applications in CMOS and BiCMOS technologies

High-linearity RF Amplifier Design Peter B. Kenington, 2000 Based on the author's real world design experience in this key emerging area this is the first single comprehensive guide to examine and directly compare all major RF power amplifier linearization techniques in detail Packed with practical tips more than 250 illustrations and over 600 verified equations the book saves you valuable design time while

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