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Memory Effects in Power Amplification Systems; 2.4.1 Origins of Memory Effects; 2.4.2 Electrical Memory Effects; 2.4.3 Thermal Memory Effects; 2.5 Volterra Series Models; References
Chapter 3 Model Performance Evaluation3.1 Introduction; 3.2 Behavioral Modeling versus Digital Predistortion; 3.3 Time Domain Metrics; 3.3.1 Normalized Mean Square Error; 3.3.2 Memory Effects Modeling Ratio; 3.4 Frequency Domain Metrics; 3.4.1 Frequency Domain Normalized Mean Square Error; 3.4.2 Adjacent Channel Error Power Ratio; 3.4.3 Weighted Error Spectrum Power Ratio; 3.4.4 Normalized Absolute Mean Spectrum Error; 3.5 Static Nonlinearity Cancelation Techniques; 3.5.1 Static Nonlinearity Pre-Compensation Technique; 3.5.2 Static Nonlinearity Post-Compensation Technique
3.5.3 Memory Effect Intensity3.6 Discussion and Conclusion; References; Chapter 4 Quasi-Memoryless Behavioral Models; 4.1 Introduction; 4.2 Modeling and Simulation of Memoryless/Quasi-Memoryless Nonlinear Systems; 4.3 Bandpass to Baseband Equivalent Transformation; 4.4 Look-Up Table Models; 4.4.1 Uniformly Indexed Loop-Up Tables; 4.4.2 Non-Uniformly Indexed Look-Up Tables; 4.5 Generic Nonlinear Amplifier Behavioral Model; 4.6 Empirical Analytical Based Models; 4.6.1 Polar Saleh Model; 4.6.2 Cartesian Saleh Model; 4.6.3 Frequency-Dependent Saleh Model; 4.6.4 Ghorbani Model
4.6.5 Berman and Mahle Phase Model4.6.6 Thomas-Weidner-Durrani Amplitude Model; 4.6.7 Limiter Model; 4.6.8 ARCTAN Model; 4.6.9 Rapp Model; 4.6.10 White Model; 4.7 Power Series Models; 4.7.1 Polynomial Model; 4.7.2 Bessel Function Based Model; 4.7.3 Chebyshev Series Based Model; 4.7.4 Gegenbauer Polynomials Based Model; 4.7.5 Zernike Polynomials Based Model; References; Chapter 5 Memory Polynomial Based Models; 5.1 Introduction; 5.2 Generic Memory Polynomial Model Formulation; 5.3 Memory Polynomial Model; 5.4 Variants of the Memory Polynomial Model; 5.4.1 Orthogonal Memory Polynomial Model
5.4.2 Sparse-Delay Memory Polynomial Model

Sommario/riassunto

Covers theoretical and practical aspects related to the behavioral modelling and predistortion of wireless transmitters and power amplifiers. It includes simulation software that enables the users to apply the theory presented in the book. In the first section, the reader is given the general background of nonlinear dynamic systems along with their behavioral modelling from all its aspects. In the second part, a comprehensive compilation of behavioral models formulations and structures is provided including memory polynomial based models, box oriented models such as Hammerstein-based and Wiener-based models, and neural networks-based models. The book will be a valuable resource for design engineers, industrial engineers, applications engineers, postgraduate students, and researchers working on power amplifiers modelling, linearization, and design.