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LDMOS; 1.7.7 MESFET; 1.7.8 HEMT; 1.7.9 General Remarks; 1.8 Appendix: Demonstration of Useful Relationships; 1.9 References; 2 Power Amplifier Design; 2.1 Introduction; 2.2 Design Flow; 2.3 Simplified Approaches; 2.4 The Tuned Load Amplifier; 2.5 Sample Design of a Tuned Load PA; 2.6 References; 3 Nonlinear Analysis for Power Amplifiers; 3.1 Introduction; 3.2 Linear vs. Nonlinear Circuits 3.3 Time Domain Integration 3.3.1 Iterative Algorithm (Newton-Raphson and Fixed-point); 3.4 Example; 3.4.1 Forward Euler Solution; 3.4.2 Backward Euler Solution; 3.4.3 Steady-state Analysis and Shooting Method; 3.4.4 Example; 3.5 Solution by Series Expansion; 3.6 The Volterra Series; 3.6.1 Response to a Single-tone Excitation; 3.6.2 Response to a Two-tone Excitation; 3.6.3 The Probing Method; 3.6.4 Example; 3.6.5 Cascade of Systems; 3.7 The Fourier Series; 3.8 The Harmonic Balance; 3.8.1 Example; 3.8.2 Multi-tone HB Analysis; 3.9 Envelope Analysis; 3.10 Spectral Balance
3.11 Large Signal Stability Issue 3.12 References; 4 Load Pull; 4.1 Introduction; 4.2 Passive Source/Load Pull Measurement Systems; 4.3 Active Source/Load Pull Measurement Systems; 4.3.1 Two-signal Path Technique; 4.3.2 Active Loop Technique; 4.4 Measurement Test-sets; 4.4.1 Scalar Systems; 4.4.2 VNA Based Systems; 4.4.3 Six-port Reflectometer Based Systems; 4.5 Advanced Load Pull Measurements; 4.5.1 Intermodulation Measurements; 4.5.2 Time-domain Waveform Load Pull; 4.5.3 Pulsed Load Pull; 4.6 Source/Load Pull Characterization; 4.7 Determination of Optimum Load Condition
4.7.1 Example of Simplified Load Pull Contour 4.7.2 Design of an Amplifier Stage using Simplified Load Pull Contours; 4.8 Appendix: Construction of Simplified Load Pull Contours through Linear Simulations; 4.9 References; 5 High Efficiency PA Design Theory; 5.1 Introduction; 5.2 Power Balance in a PA; 5.3 Ideal Approaches; 5.3.1 Tuned Load; 5.3.2 Class F or Inverse Class F (Class F-1); 5.3.3 Class E or General Switched-mode; 5.4 High Frequency Harmonic Tuning Approaches; 5.4.1 Mathematical Statements; 5.5 High Frequency Third Harmonic Tuned (Class F); 5.6 High Frequency Second Harmonic Tuned 5.7 High Frequency Second and Third Harmonic Tuned

Sommario/riassunto

Do you want to know how to design high efficiency RF and microwave solid state power amplifiers? Read this book to learn the main concepts that are fundamental for optimum amplifier design. Practical design techniques are set out, stating the pros and cons for each method presented in this text. In addition to novel theoretical discussion and workable guidelines, you will find helpful running examples and case studies that demonstrate the key issues involved in power amplifier (PA) design flow. Highlights include:Clarification of topics which are often misunderstood and misused,