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Soggetti	Shoulder - Surgery Elbow - Surgery Arm - Surgery Shoulder - surgery Elbow - surgery Upper Extremity - surgery Periodical Periodicals.
Lingua di pubblicazione	Inglese
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Livello bibliografico	Periodico
Note generali	Refereed/Peer-reviewed "A Publication of the Journal of Shoulder and Elbow Surgery"--Cover.

2. Record Nr.	UNINA9910827953503321
Titolo	Nonlinear transistor model parameter extraction techniques / / edited by Matthias Rudolph, Christian Fager, David E. Root [[electronic resource]]
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ISBN	1-107-22467-5 1-283-34235-9 1-139-16026-5 9786613342355 1-139-15465-6 1-139-16126-1 1-139-15569-5 1-139-15744-2 1-139-15921-6 1-139-01496-X
Descrizione fisica	1 online resource (xiv, 352 pages) : digital, PDF file(s)
Collana	The Cambridge RF and microwave engineering series
Disciplina	621.3815/28
Soggetti	Transistors - Mathematical models Electronic circuit design
Lingua di pubblicazione	Inglese
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Livello bibliografico	Monografia
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover; Nonlinear Transistor Model Parameter Extraction Techniques; The Cambridge RF and Microwave Engineering Series; Title; Copyright; Contents; List of contributors; Preface; 1 Introduction; 1.1 Model extraction challenges; 1.1.1 Accuracy; 1.1.1.1 Circuit application; 1.1.1.2 Measurement uncertainty; 1.1.1.3 Process variations; 1.1.2 Numerical convergence; 1.1.2.1 Breakdown; 1.1.2.2 Self-heating; 1.1.3 Choice of the modeling transistor; 1.2 Model extraction workflow; References; 2 DC and thermal modeling: III--V FETs and HBTs; 2.1 Introduction; 2.2 Basic DC characteristics 2.3 FET DC parameters and modeling2.4 HBT DC parameters and modeling; 2.5 Process control monitoring; 2.6 Thermal modeling

overview; 2.7 Physics-based thermal scaling model for HBTs; 2.8 Measurement-based thermal model for FETs; 2.9 Transistor reliability evaluation; Acknowledgments; References; 3 Extrinsic parameter and parasitic elements in III--V HBT and HEMT modeling; 3.1 Introduction; 3.2 Test structures with calibration and de-embedding; 3.3 Methods for extrinsic parameter extraction used in HBTs; 3.3.1 Equivalent circuit topology; 3.3.2 Physical description of contact resistances and overlap capacitances; 3.3.3 Extrinsic resistance and inductance extraction; 3.4 Methods for extrinsic parameter extraction used in HEMTs; 3.4.1 Cold FET technique; 3.4.2 Unbiased technique; 3.4.3 GaN HEMTs exceptions; 3.5 Scaling for multicell arrays; References; 4 Uncertainties in small-signal equivalent circuit modeling; 4.1 Introduction; 4.1.1 Sources of uncertainty in modeling; 4.1.2 Measurement uncertainty; 4.2 Uncertainties in direct extraction methods; 4.2.1 Simple direct extraction example; 4.2.1.1 Example circuit and measurements; 4.2.1.2 Uncertainty analysis; 4.2.1.3 Parameter estimation; 4.2.1.4 Parameter correlations; 4.2.2 Results using transistor measurements; 4.2.2.1 Uncertainty contributions; 4.2.2.2 Intrinsic model parameter sensitivities; 4.2.2.3 Intrinsic model parameter uncertainties; 4.2.2.4 Multibias extraction results; 4.3 Optimizer-based estimation techniques; 4.3.1 Maximum likelihood estimation; 4.3.1.1 Simple example; 4.3.1.2 MLE uncertainty; 4.3.2 MLE of small-signal transistor model parameters; 4.3.2.1 Parasitic parameter estimation; 4.3.2.2 Application to parasitic FET model extraction; 4.3.2.3 MLE of intrinsic model parameters; 4.3.2.4 Application to intrinsic FET model extraction; 4.3.3 Comparison between MLE and the direct extraction method; 4.3.4 Application of MLE in RF-CMOS de-embedding; 4.3.4.1 Method description; 4.3.4.2 Example using 130 nm RF-CMOS measurements; 4.3.4.3 Comparison between different de-embedding methods; 4.3.5 Discussion; 4.4 Complexity versus uncertainty in equivalent circuit modeling; 4.4.1 Finding an optimum model topology; 4.4.2 An illustrative example; 4.4.2.1 MSE estimation procedure; 4.4.2.2 Results; 4.5 Summary and discussion; References; 5 The large-signal model: theoretical foundations, practical considerations, and recent trends

Sommario/riassunto

Achieve accurate and reliable parameter extraction using this complete survey of state-of-the-art techniques and methods. A team of experts from industry and academia provides you with insights into a range of key topics, including parasitics, intrinsic extraction, statistics, extraction uncertainty, nonlinear and DC parameters, self-heating and traps, noise, and package effects. Learn how similar approaches to parameter extraction can be applied to different technologies. A variety of real-world industrial examples and measurement results show you how the theories and methods presented can be used in practice. Whether you use transistor models for evaluation of device processing and you need to understand the methods behind the models you use, or you want to develop models for existing and new device types, this is your complete guide to parameter extraction.