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Nota di contenuto	Intro; Microwave Power Amplifier Design with MMIC Modules; Contents; Preface; Introduction; Part I: Useful Microwave Design Concepts; Part II: Designing the Power Amplifier; Part III: Designing the Power Amplifier System; Summary; Chapter 1 Introduction; 1.1 Introduction to Designing Microwave Solid State Power Amplifiers; 1.2 Applications of SSPAs; 1.3 A Typical SSPA Configuration; 1.4 Typical Documents Starting a Project; 1.5 General Format of the SCD; 1.5.1 Paragraph 1.0: Scope; 1.5.2 Paragraph 2.0: Applicable Documents; 1.5.3 Paragraph 3.0: Requirements; 1.5.4 Paragraph 4.0: Verification. 1.5.5 Paragraph 5.0: Packaging1.5.6 Paragraph 6.0: Notes; 1.6 Requirements Section of an SCD; 1.6.1 Electrical Requirements; 1.6.2 Mechanical Requirements; 1.6.3 Environmental Requirements; 1.6.4 Other Design Criteria; References; Part I Useful Microwave Design Concepts; Chapter 2 Lumped Components in RF and Microwave Circuitry; 2.1 Applicability of Lumped Element Analysis; 2.1.1 Calculating Wavelengths; 2.1.2 Example: Calculating Wavelengths for Lumped Circuit Analysis; 2.2 Capacitor Characteristics at High Frequencies; 2.2.1 Single-Layer and Multilayer Capacitor Construction. 2.2.2 High-Frequency Capacitor Models2.2.3 Capacitor Losses (Q); 2.2.4 Capacitor Resonance; 2.3 Resistor Characteristics at High Frequencies; 2.3.1 High-Frequency Surface Mount Resistors; 2.3.2 Flip-

Chip Surface Mount Resistors; 2.3.3 Thick-Film and Thin-Film Surface-Mount Resistors; 2.3.4 High-Frequency Effects of Thick-Film and Thin-Film Resistors; 2.3.5 Notes on Thin-Film Resistors; 2.3.6 Notes on Thick-Film Resistors; 2.4 Inductors; 2.4.1 Calculating Inductance of a Cylindrical Coil of Wire; 2.4.2 Inductors at High Frequencies; 2.4.3 Inductors at Resonance. 2.4.4 Inductance of a Straight Wire 2.4.5 Planar Spiral Inductors; 2.4.6 Conical Inductors; 2.4.7 Inductance of Via Holes; 2.4.8 Inductance of Bond Wire; 2.4.9 Inductance of Flat or Ribbon Wire; References; Chapter 3 Transmission Lines; 3.1 Introduction to Transmission Line Theory; 3.2 Common Transmission Line Topologies; 3.3 Transmission Line Characteristics Using Lumped Circuit Elements; 3.3.1 Distributed Lumped Constant Model; 3.3.2 Modeling a Microstrip Transmission Line with Distributed Lumped Elements; 3.3.3 Characteristic Impedance of Transmission Line from the Lumped Circuit Model.

Sommario/riassunto

Solid state power amplifiers (SSPA) are a critical part of many microwave systems. Designing SSPAs with monolithic microwave integrated circuits (MMIC) has boosted device performance to much higher levels focused on PA modules. This cutting-edge book offers engineers practical guidance in selecting the best power amplifier module for a particular application and interfacing the selected module with other power amplifier modules in the system. It also explains how to identify and mitigate peripheral issues concerning the PA modules, SSPAs, and microwave systems. This authoritative volume presents the critical techniques and underpinnings of SSPA design, enabling professionals to optimize device and system performance. Engineers gain the knowledge they need to evaluate the optimum topologies for the design of a chain of microwave devices, including power amplifiers. Additionally, the book addresses the interface between the microwave subsystems and the primary DC power, the control and monitoring circuits, and the thermal and EMI paths. Packed with 240 illustrations and over 430 equations, this detailed book provides the practical tools engineers need for their challenging projects in the field.
