

RF and Microwave Wide Bandgap Devices and Integrated Circuits

Tutorial

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1. Introduction
2. Materials for MESFETs and HEMTs
3. Principles of Operation for Power Transistors
 - a. Power densities
 - b. Breakdown voltages
 - c. Robustness
 - d. Typical results
4. Large-Signal Models
5. Thermal Modeling and Management
6. Design of Amplifiers
 - a. Narrow-band Power Amplifiers – electrical and thermal
 - b. Broad-band Power Amplifiers – electrical and thermal
 - c. CW versus Pulsed operation
 - d. Low-noise Amplifiers – high dynamic range
 - e. Examples
7. Design of Power Switches
8. Packaging
 - a. Different heat-sink materials
 - b. Thermal resistance
 - c. Package modeling
 - d. Examples
9. Reliability assessment
10. SiC MESFET and GaN HEMT monolithic microwave integrated circuits (MMICs)
 - a. Circuit design principles
 - b. Passive components
 - c. Examples
11. Other RF Components
 - a. Schottky Diodes
 - b. Limiters
 - c. Varactors
12. High-Temperature Electronics
13. Conclusions