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Nota di contenuto	Power Electronics Semiconductor Devices; Table of Contents; Preface; Chapter 1. Power MOSFET Transistors; 1.1. Introduction; 1.2. Power MOSFET technologies; 1.2.1. Diffusion process; 1.2.2. Physical and structural MOS parameters; 1.2.3. Permanent sustaining current; 1.3. Mechanism of power MOSFET operation; 1.3.1. Basic principle; 1.3.2. Electron injection; 1.3.3. Static operation; 1.3.4. Dynamic operation; 1.4. Power MOSFET main characteristics; 1.5. Switching cycle with an inductive load; 1.5.1. Switch-on study; 1.5.2. Switch-off study 1.6. Characteristic variations due to MOSFET temperature changes 1.7. Over-constrained operations; 1.7.1. Overvoltage on the gate; 1.7.2. Over-current; 1.7.3. Avalanche sustaining; 1.7.4. Use of the body diode; 1.7.5. Safe operating areas; 1.8. Future developments of the power MOSFET; 1.9. References; Chapter 2. Insulated Gate Bipolar Transistors; 2.1. Introduction; 2.2. IGBT technology; 2.2.1. IGBT structure; 2.2.2. Voltage and current characteristics; 2.3. Operation technique; 2.3.1. Basic principle; 2.3.2. Continuous operation; 2.3.3.

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2.5 One cycle of hard switching on the inductive load  
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## Sommario/riassunto

This book relates the recent developments in several key electrical engineering R&D labs, concentrating on power electronics switches and their use. The first sections deal with key power electronics technologies, MOSFETs and IGBTs, including series and parallel associations. The next section examines silicon carbide and its potentiality for power electronics applications and its present limitations. Then, a dedicated section presents the capacitors, key passive components in power electronics, followed by a modeling method allowing the stray inductances computation, necessary for the precise

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