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4.2 Energy Harvesting as a Pathway to Miniaturization4.3 Implementation of Implantable Devices; 4.3.1 RF Power Harvesting; 4.3.1.1 Matching Network; 4.3.1.2 Rectifier; 4.3.1.3 Regulator and Bandgap Reference; 4.3.1.4 Low-Power Controller and Auxiliary Circuits in the Implant Functional Block; 4.3.2 Wireless Communication Link; 4.3.2.1 Forward Data Link; 4.3.2.2 Reverse Data Link; 4.3.3 Payload and Applications: Locomotive Implant and Implantable Cardiac Probe; 4.3.3.1 Actuation for Therapeutics: Millimeter-Sized Wirelessly Powered and Remotely Controlled Locomotive Implant
4.3.3.2 Low-Power Sensing for Diagnostics: Implantable Intracardiac Probe4.4 Conclusion; References; Chapter 5 Cross-Hierarchy Design Exploration for Implantable Electronics; 5.1 Introduction; 5.2 System Overview of a Generic Bioelectronic Implant; 5.3 Circuit Design for Low-Power Signal Processing; 5.3.1 Design Challenges for Low-Power Bioelectronic Sensor Interface; 5.3.2 Analog Signal Processing Using Subthreshold Circuits; 5.3.3 Analog-to-Digital Conversion; 5.3.4 Low-Power Digital Signal Processing; 5.3.4.1 VDD Scaling and Parallel Processing
5.3.4.2 Dynamic Voltage and Frequency Scaling

Sommario/riassunto

Here the renowned editor Evgeny Katz has chosen contributions that cover a wide range of examples and issues in implantable bioelectronics, resulting in an excellent overview of the topic. The various implants covered include biosensoric and prosthetic devices, as well as neural and brain implants, while ethical issues, suitable materials, biocompatibility, and energy-harvesting devices are also discussed.A must-have for both newcomers and established researchers in this interdisciplinary field that connects scientists from chemistry, material science, biology, medicine, and electrical eng