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Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Introduction.- State-of-the-Art CMOS In Vitro Diagnostic Devices. - Electronic-Automated Micro-NMR Assay with DMF Device.- One-Chip Micro-NMR Platform with B0-field Stabilization -- Conclusion and Outlook -- Appendix -- Index.
Sommario/riassunto	The book Handheld Total Chemical and Biological Analysis Systems: Bridging NMR, Digital Microfluidics, and Semiconductorscenters on the complete design of Nuclear Magnetic Resonance (NMR) microsystems for in vitro chemical and biological assays based on semiconductor chips and portable magnet. Different sensing mechanisms for CMOS in vitro assay are compared, key design criteria of the CMOS transceiver for NMR measurement are revealed, and system-level optimizations of the CMOS NMR platform utilizing digital microfluidic and diverse functions of the CMOS technology are discussed. Two CMOS NMR platforms are implemented, each of these focuses on different aspect

of optimization. Shows literature review about state-of-the-art CMOS in vitro diagnosis systems and their sensing mechanisms; Shows brief physics background on biological sensing with NMR; Shows detailed design of the CMOS transceiver for NMR experiments; Describes the first CMOS NMR platform integrated with digital microfluidic devices for electronic-automated sample management; Demonstrates magnetic field stabilization for the portable magnet to enhance the robustness of the NMR platform with the aid of CMOS vertical Hall sensor.