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Nota di contenuto	Introduction to Electrical 3D Integration -- Copper-based TSV – Interposer -- Multi-TSV Crosstalk Channel Equalization with Non-Uniform Quantization -- Energy Efficient Electrical Intra-Chip Stack Communication -- Clock Generators for Heterogeneous MPSoCs within 3D Chip Stacks -- Energy Efficient Communications Employing 1-Bit Quantization at the Receiver -- 2-nm Laser Synthesized Si-Nanoparticles for Low Power Memory Applications -- Accurate Temperature Measurement for 3D Thermal Management -- EDA Environments for 3D Chip Stacks -- Integrating 3D Floorplanning and Optimization of Thermal Through-Silicon Vias -- Introduction to Optical Inter- and Intraconnects -- Optical Through-Silicon Vias -- Integrated Optical Devices for 3D Photonic Transceivers -- Cantilever Design for Tunable WDM Filters based on Silicon Microring Resonators -- Athermal photonic circuits for optical on-chip interconnects -- Integrated Circuits for 3D Photonic Transceivers -- Review of interdigitated back contacted full heterojunction solar cell (IBC-SHJ): a simulation approach.-.

Sommario/riassunto

This book explains for readers how 3D chip stacks promise to increase the level of on-chip integration, and to design new heterogeneous semiconductor devices that combine chips of different integration technologies (incl. sensors) in a single package of the smallest possible size. The authors focus on heterogeneous 3D integration, addressing some of the most important challenges in this emerging technology, including contactless, optics-based, and carbon-nanotube-based 3D integration, as well as signal-integrity and thermal management issues in copper-based 3D integration. Coverage also includes the 3D heterogeneous integration of power sources, photonic devices, and non-volatile memories based on new materials systems.   •Provides single-source reference to the latest research in 3D optoelectronic integration: process, devices, and systems; •Explains the use of wireless 3D integration to improve 3D IC reliability and yield; •Describes techniques for monitoring and mitigating thermal behavior in 3D ICs; •Includes discussion of 3D integration of high-density power sources and novel NVM.