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High-Reliability Semiconductor Devices and Integrated Circuits, 3rd Edition

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The rapid development of intelligent transportation, aerospace electronics, avionics, and safety-critical systems has increased the demand for reliable semiconductor devices and integrated circuits. These applications require stable operation under harsh conditions, including radiation, electromagnetic interference, temperature variations, and aging. Meanwhile, complex SoC architectures and heterogeneous integration bring new challenges to reliability analysis, functional safety verification, and design optimization. This Reprint, “High-Reliability Semiconductor Devices and Integrated Circuits”, provides a platform for research on modeling, simulation, design, optimization, and reliability evaluation of semiconductor devices and circuits, with applications in automotive electronics, aerospace systems, and other critical fields. Recent advances in semiconductor technologies, fault-tolerant architectures, radiation-hardening methods, and safety verification have improved system reliability. Artificial intelligence and data-driven approaches also enable efficient reliability prediction, design automation, and fault analysis. This Reprint highlights research on reliability modeling, simulation methods, optimization techniques, and evaluation approaches under extreme environments. Future high-reliability systems require collaboration among the areas of semiconductor technology, circuit design, electronic design automation, artificial intelligence, and functional safety engineering.



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