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Nota di contenuto	Intro; Space Microelectronics Volume 2: Integrated Circuit Design for Space Applications; Introduction; Preface; Chapter 1 Considerations for Selection and Application of Foreign Electronic Component Bases in Designing Domestic Spacecraft; 1.1 General Problems of ECB Selection for REE of Space Application; 1.2 Restriction on Export of Foreign-Made Electronic Components to Russia; 1.2.1 Restriction of ECB Exports from the United States; 1.2.2 Restriction on ECB Exports from Europe and Other Countries; 1.2.3 International Export Control Organizations 1.3 Peculiarities of Application of Foreign-Made Industrial ECB in Rocket and Space Technology1.4 Counterfeit Microelectronic Products and Methods of Their Detection; 1.4.1 Types of Counterfeit Components; 1.4.2 Effective Methods of Detecting Counterfeit Products; 1.4.3 Electric Testing of Microelectronic Products for Space Application; 1.5 Peculiarities of Selection and Application of Foreign Processors in Domestic Spacecraft; 1.5.1 Application Aspects of Foreign Processors in Domestic Spacecraft; 1.5.2 Versions and Qualifications of UT 699 and GR 712 Microprocessors 1.5.3 Architecture and Hardware Features of UT 699 and GR 712 Microprocessors of Leon 3FT Family1.5.4 Peculiarities of Microprocessor Leon 3 Programming; 1.6 Radiation-Tolerant DC Converters for Space and Military Applications; 1.6.1 Total Ionizing

Dose (TID); 1.6.2 Enhanced Low-Dose Rate Sensitivity (ELDRS); 1.6.3 Single Event Effects (SEE); 1.6.4 Analysis of Parameter Limits in Worst-Case Scenarios; 1.6.5 MIL-PRF-38534 Standard Class K Requirements; 1.6.6 Absence of Optocouplers in Hybrid DC-DC Converters
1.7 Best Practices of Work Arrangement for Producing Electronic Components of Space System On-Board Equipment
1.8 Accelerated Reliability Testing of ECB SA; 1.9 Analysis of Test Results for Microcircuits Purchased in Russia Between 2009 and 2011; References;
Chapter 2 Peculiarities of the Technological Process of Production and Basic Constructions of Submicron Transistors and Schottky Diodes; 2.1 On the Terminology of Submicron Microelectronics; 2.2 Tendencies and Perspectives of Modern Technology Development in Microelectronics; 2.2.1 Scaling Problem
2.2.2 Modern Submicron Technology: An Example of Its Implementation for Microprocessor Production
2.3 Peculiarities of Submicron MOS Transistors; 2.3.1 MOS Transistors Structures in VLSIC; 2.3.2 Methods to Improve MOS Transistor Properties; 2.3.3 MOS Transistors with the Structure Silicon on Insulator; 2.3.4 Transistors with Double, Triple, and Cylindrical Gates; 2.3.5 Other Types of Transistor Structures; 2.3.6 The Peculiarities of Transistors for Analog Applications; 2.4 Constructional-Technological Peculiarities of High-Temperature Schottky Diodes

Sommario/riassunto

This invaluable second volume of a two-volume set is filled with details about the integrated circuit design for space applications. Various considerations for the selection and application of electronic components for designing spacecraft are discussed. The basic constructions of submicron transistors and schottky diodes during the technological process of production are explored. This book provides details on the energy consumption minimization methods for microelectronic devices.

Specific topics include:

- Features and physical mechanisms of the effect of space radiation on all the main classes of microcircuits, including peculiarities of radiation impact on submicron integrated circuits;
- Special design, technology, and schematic methods of increasing the resistance to various types of space radiation;
- Recommendations for choosing research equipment and methods for irradiating various samples;
- Microcircuit designers on the composition of test elements for the study of the effect of radiation;
- Microprocessors, circuit boards, logic microcircuits, digital, analog, digital-analog microcircuits manufactured in various technologies (bipolar, CMOS, BiCMOS, SOI);
- Problems involved with designing high speed microelectronic devices and systems based on SOS-and SOI-structures;
- System-on-chip and system-in-package and methods for rejection of silicon microcircuits with hidden defects during mass production.
