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3.2.4 Solar Array ESD Design Guidelines 3.2.5 Special Situations ESD Design Guidelines; References; 4 Spacecraft Test Techniques; 4.1 Test Philosophy; 4.2 Simulation of Parameters; 4.3 General Test Methods; 4.3.1 ESD-Generating Equipment; 4.3.2 Methods of ESD Applications; References; 5 Control and Monitoring Techniques; 5.1 Active Spacecraft Charge Control; 5.2 Environmental and Event Monitors; References; 6 Material Notes and Tables; 6.1 Dielectric Material List; 6.2 Conductor Material List; References; A Nomenclature; A.1 Constants and Measurement Units; A.2 Acronyms and Abbreviations
A.3 Defined Terms A.4 Variables; A.5 Symbols; B The Space Environment; B.1 Introduction to Space Environments; B.1.1 Quantitative Representations of the Space Environment; B.1.2 Data Sources; B.2 Geosynchronous Environments; B.2.1 Geosynchronous Plasma Environments; B.2.2 Geosynchronous High-Energy Environments; B.3 Other Earth Environments; B.3.1 MEO; B.3.2 PEO; B. 3.3 Molniya Orbit; B.4 Other Space Environments; B.4.1 Solar Wind; B. 4.2 Earth, Jupiter, and Saturn Magnetospheres Compared; References; C Environment, Electron Transport, and Spacecraft Charging Computer Codes
C.1 Environment Codes C.1.1 AE8/AP8; C.1.2 CRRES; C.1.3 Flux Model for Internal Charging (FLUMIC); C.1.4 GIRE/SATRAD; C.1.5 Handbook of Geophysics and the Space Environment; C.1.6 L2 Charged Particle Environment (L2-CPE); C.1.7 MIL-STD-1809, Space Environment for USAF Space Vehicles; C.1.8 Geosynchronous Plasma Model; C.1.9 Others; C.2 Transport Codes; C.2.1 Cosmic Ray Effects on MicroElectronics 1996 (CREME96); C.2.2 EGS4; C.2.3 Geant4; C.2.4 Integrated TIGER Series (ITS); C.2.5 MCNP/MCNPE; C.2.6 NOVICE; C.2.7 NUMIT; C.2.8 SHIELDOSE; C.2.9 SPENVIS/DICTAT; C.2.10 TRIM; C.2.11 Summary
C.3 Charging Codes

Sommario/riassunto

"Guide to Spacecraft Charging Effects is a single reference source containing both theory of spacecraft charging and suggested practical detailed spacecraft design requirements and procedures to minimize the effects of spacecraft charging and to limit the effects of the resulting electrostatic discharge.This book contains virtually the whole body of spacecraft charging knowledge as of today, moving from first principles for the beginner to intermediate and more advanced concepts.? Many equations are present to provide a good theoretical background,?as well as numerous charts, graphs, figures, tables, and photos to summarize and illustrate the theoretical background in a practical presentation. Numerous appendices expand on the main text, a well thought-out index gives quick access to important concepts, and an extensive list of references provides further avenues of research for those wishing to extend their knowledge.Much of the environmental data and material response information has been adapted from published and unpublished scientific literature for use in this document.? It is the book form of the recently issued NASA Technical Handbook NASA-HDBK-4002A, March 3, 2011 (by the same authors).? In particular, this book can be used as the textbook form of that Handbook and its earlier sources, NASA Technical Paper 2361, 1984, and NASA Technical Handbook NASA-HDBK-4002, 1999 (both co-authored by the current authors).Since the original writing of the 2361 and 4002, there have been many developments in the understanding of spacecraft charging issues and mitigation solutions, as well as advanced technologies needing new mitigation solutions.? Solar cell technology, especially higher voltage arrays have been found to need new design approaches; these are described in detail in this new book.? Information about the space plasma environment has been studied

more thoroughly; that information is in this new book.? New analytic computer codes have been developed to help analyze spacecraft charging; they are described and listed in this new book.? Spacecraft anomalies and failures have emphasized certain designs that are now known to be of greater importance than others; that knowledge is incorporated in this new book"--Provided by publisher.