Resources for Radiation Test Data

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Abstract: We present resources for aerospace engineers or spacecraft design engineers to use when searching for radiation test data.

Test Data Research Samples

IEEE Radiation Effects Data Workshop

The IEEE Radiation Effects Data Workshop (REDW) provides past and present data for searching SEE, SET, SEU, SEFIs, SEL, SEB, SEGR, dose rate, displacement damage, facilities, and shielding. Figure 9 on page 7 shows a sample of data features.

European Space Components Information Exchange System

European Space Components Information Exchange System offers many search options including description, manufacturer, part number, cadence, data, data sheet, test report, and more. Figure 10 on page 7 shows a sample of data features.

Other Search Tools

Search tools like Google can be useful in finding radiation test data. However, even with specific search keywords, there may be too much information to review. This poster recommends searching for keywords in radiation effects or test data research interfaces that may also include search tools.

Cautions

• Be aware of the keyword or phrase that may be used for the test data. It may be necessary to verify that the search tool results are legitimate.

Acknowledgment

This work was supported in part by the National Aeronautics and Space Administration (NASA) and the Defense Threat Reduction Agency (DTRA). The authors gratefully acknowledge the Defense Threat Reduction Agency (DTRA) for partial support of the current research.

Summary

This poster is intended to be a resource for modern devices and electronics to search test data. Acknowledgments are given to the authors and the Defense Threat Reduction Agency for support.

References


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Introduction

The performance of electronic devices in space is limited by susceptibility to single-event effects (SEE), total ionizing dose (TID), and displacement damage (DD). Sustained exposure to a radiation environment may impose a penalty that reduces the system’s operation time. This penalty is often due to a dramatic increase in the failure rate. However, recent advances in radiation effects research have provided a greater understanding of the test methods issues. The performance of electronic devices in a space radiation environment is often limited by susceptibility to single-event effects (SEE), total ionizing dose (TID), and displacement damage (DD). These effects can be critical to the operation of spacecraft and are a concern for the aerospace engineer or spacecraft design engineer. Understanding these effects is critical [1].

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National Aeronautics and Space Administration (NASA)/Center Space Flight Center (GSFC) Radiation Effects and Analysis Group (REAG) website provides detailed REAG test reports, test dates, test report file name, test type, and category. Figure 1 shows the search interface.

Radiation Effects Data Workshop (REDW) Record website provides a reference index of radiation effects papers and testing sites, organized by date of publication in the REDW Record. Figure 2 shows the search interface.

Defense Logistics Agency (DLA) Land and Maritime, the largest inventory Control Point (KP) in the world. Their website contains the 512K X 8-bit rad-hard low voltage SRAM parts and their website allows a search on any page within the site for any part number. See Figure 10 on page 7.

European Space Components Information Exchange System, see https://escies.org/labreport/radiationList. European Space Components Information Exchange System offers many search options including description, manufacturer, part number, cadence, data, data sheet, test report, and more. Figure 11 on page 7 shows a sample of data features.

IEEE Xplore Radiation Effects Data Workshop (REDW) Record. IEEE Xplore Radiation Effects Data Workshop (REDW) Record website provides a reference index of radiation effects papers and testing sites, organized by date of publication in the REDW Record. Figure 3 shows the search interface.

References


Acronyms

• SEE = single-event effects (SEE)
• SET = single-event transients (SET)
• SEU = single-event upset (SEU)
• SEFIs = single-event functional interface errors (SEFIs)
• SEL = single-event latchup (SEL)
• SEB = single-event burnout (SEB)
• SEGR = single-event gate rupture (SEGR)
• RHA = Radiation Hardness Assured (RHA)
• REDW = Radiation Effects Data Workshop (REDW)
• SETs = single-event transients (SETs)