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Radiation Hardened Electronics Market Size, Share & Trends Analysis Report By Component, By Manufacturing Technique, By Product Type, By Application, By Region, And Segment Forecasts, 2024 - 2030

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Abstracts

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Radiation Hardened Electronics Market Growth & Trends

The global radiation hardened electronics market size is anticipated to reach USD 2.42 billion by 2030, growing at a CAGR of 5.7% from 2024 to 2030, according to a new report by Grand View Research, Inc. This growth is primarily driven by the increasing demand for electronics globally, especially in sectors where dependability and safety are critical. The ongoing research and development efforts in material science, design techniques, and testing methodologies lead to enhanced performance, reliability, and affordability of radiation-hardened (rad-hard) electronics.

In space applications, rad-hard chips are crucial due to the harsh environment, including exposure to high levels of damaging radiation. New generations of radiation-hardened electronics are expected to revolutionize space-based devices by enabling onboard processing capabilities that enhance spacecraft autonomy, artificial intelligence/machine learning applications, and overall reliability.

Furthermore, in the nuclear energy sector, rad-hard chips are vital in making modern atomic power plants safer and more efficient. As the focus shifts towards fusion energy as a cleaner and more powerful alternative to traditional fission reactors, the demand for radiation-hardened electronics is expected to increase over the forecast period.

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Radiation Hardened Electronics Market Report Highlights

Based on component, the power management segment accounted for the largest revenue share of 29.2% in 2023. Power management is essential for ensuring the reliable operation of electronic systems in environments with high radiation levels

Based on manufacturing technique, the Radiation Hardening by Device (RHBD) segment held the largest revenue share in 2023. This component plays a crucial role in ensuring the reliability and functionality of electronic systems in radiation-prone environments like space by implementing specific design strategies to mitigate the effects of radiation on electronic components

Based on product type, the custom-made segment is anticipated to register the fastest CAGR from 2024 to 2030. They are tailored to resist various types of radiation and prevent physical damage, ensuring reliable performance over an extended period.

Based on the application, the space sector accounted for the largest market revenue share in 2023. The radiation sources such as cosmic rays, nuclear explosions, and residual radiation from isotopes pose significant challenges to electronic systems, making radiation hardening crucial for satellites, spacecraft, and military aircraft.

In April 2022, Infineon Technologies AG introduced the first radiation-hardened, serial interface Ferroelectric RAM (F-RAM) for space applications, offering exceptional reliability, data retention, and energy efficiency compared to non-volatile EEPROM and serial NOR Flash devices in extreme environments.

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