



Texas Instruments Uses NASA Facility to Test Advanced Spaceflight Electronics



As part of a 2006 Space Act Agreement (SAA), Texas Instruments (TI) will work with researchers at NASA Goddard Space Flight Center's Radiation Effects Facility (REF) to test and reengineer electronics that can withstand the effects of radiation in space. The agreement will enable TI to understand what would be required to engineer and market radiation-tolerant electronics to serve NASA and aerospace companies that manufacture spaceflight equipment. As the feature sizes of space electronics become smaller, the agreement will also help both organizations understand the radiation effects of scaling space electronics as well as the impact on test methodology.

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Benefits of Technology Transfer

- TI will receive radiation test data from NASA researchers, enabling the company to reengineer and validate the radiation tolerance of its spaceflight electronics.
- TI can gain a competitive advantage by choosing to market radiation-tolerant spacecraft equipment to NASA and other aerospace companies.
- If testing results are positive, NASA will have access to improved radiation-tolerant spacecraft electronics produced by TI, benefiting current and future missions as well as long-term satellite operations.
- NASA will be able to apply test data to other space electronics to understand the impact of its current test methodologies on various sizes of instruments.
- Both organizations as well as other government agencies will benefit from understanding whether current test methodologies are adequate for testing current and future electronics.

tech transfer success

On the Record

“This agreement has the potential to greatly benefit NASA’s missions in the future through use of improved space-flight electronics produced by Texas Instruments and tested right here at NASA.” - *Ted Mecum, NASA Goddard’s Innovative Partnerships Program Office*

“Understanding the result of scaling on radiation effects is critical for the future of spacecraft electronics. We can’t investigate these effects without the support of other commercial and university partners. Technology transfer makes this possible through collaborative, cost-saving agreements with research partners.” - *Ken LaBel, engineer, NASA Goddard’s Radiation Effects Facility*

About Texas Instruments

TI is a leading innovator of digital signal processing and analog technologies for semi-conductors. Headquartered in Dallas, Texas, the company has more than 30,000 employees worldwide with corporate, sales, and manufacturing facilities in more than 25 countries. Founded more than 70 years ago, TI began making semiconductors for the signal processing markets in 1996.

About Goddard’s Radiation Effects Facility

The REF was established in the 1960s to study ionization and displacement damage of electronics and materials as well as instrument calibration requirements for devices in space. Functional and parametric performance changes occur at different ionization levels in space, making the REF’s radiation-damage testing vital for a variety of aerospace equipment, including electronics, microcircuits, sensors, couplings, lenses, and filters as well as paints, coatings, and aircraft structural materials. The facility also produces and calibrates sensors, X-ray machines, and other radiation measurement instruments. Because space missions often expose materials and electronics to substantial degrees of radiation, precise measurement of their radiation tolerance is critical to help ensure the safety and longevity of long-term space operations (such as satellites on Mars).

The Transfer Process

The SAA between TI and NASA was negotiated and administered by Goddard’s Innovative Partnerships Program Office. Already a leading producer of semiconductors, TI was interested in designing electronics for space applications. Goddard’s Ken LaBel approached TI researchers about evaluating the company’s emerging technologies at the REF. The SAA gives TI access to not only Goddard’s radiation testing and validation facilities but also the Center’s on-site expertise.

Looking Ahead

Having entered into an agreement with NASA, TI is well positioned to successfully build and market spaceflight-ready electronics. The company plans to provide Goddard researchers with current models of its transistors, semiconductor parts, and other electronics with possible space application. Researchers at Goddard will radiate and electronically test these components at the REF to measure how much radiation they can withstand. In turn, TI will use this data to reengineer the parts to compensate for any failures, with the goal of demonstrating new models that will withstand expected radiation levels in space. The testing will also enable researchers to begin building a test database to record the impact of scaling technologies on radiation effects so that NASA and other organizations can develop appropriate testing methodologies for various device sizes.

For More Information

If you would like additional information about Goddard’s technology transfer opportunities, please contact:

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