RAD-HARD FOUNDRY SERVICES BOOST SECURITY FOR DEFENSE PROGRAMS IN SPACE

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Secure, high-reliability technology is a critical need for military space programs. With the New Space shift to off-the-shelf components in LEO (Low-Earth Orbit) payloads, the high-reliability defense supply chain faces higher costs, lower production volume, and slower advancement.

While commercial space is booming, military and defense programs must advance to protect growing satellite and connectivity infrastructure from foreign threats, either from destructive actions against infrastructure or compromises in data security and interference.

Foundry services open a channel for high-reliability device manufacturing that secures the supply chain for defense applications.

Spirit Electronics offers radiation-hardened foundry services through *Texas Instruments* fabs to manufacture space-grade devices with secure design, high-reliability packaging and qualification, and streamlined supply management to control cost and meet launch schedules.

SECURE DESIGN FOR SPACE-GRADE DEFENSE APPLICATIONS

Foundry services support the manufacture of device designs that can integrate multiple functions, prioritize essential functions and support legacy technology integration. The customer owns the device design in the foundry program, offering a level of design control and flexibility in defense applications for managing data security and device performance.

Custom devices can be designed into smaller form factors or for form-factor compatibility, and optimized design can also reduce power demand and increase performance.

Spirit's foundry services support analog and mixed-signal designs given the TI foundry's specialization in analog and embedded technology on any of the TI foundry processes.

Spirit's engineering team has access to IP libraries to support customers through the design stage. Customers are often able to simplify the design process by converting component configurations already in use.

Custom device designs can also be modified to create a product family covering a range of performance options.

Design ownership and control provides security around a device's technical data, and Spirit safeguards that data as a domestic supplier experienced in managing supply chain security for aerospace and defense.

Working with a domestic foundry partner adds a layer of traceability and security through the manufacturing process.

Defense-grade designs must consider compatibility with legacy technologies as well. Spirit's high-reliability foundry services support device manufacturing for end-of-life technologies to integrate legacy functionality and guarantee continued device availability over time.

RAD-HARD PROCESSES AND SPACE-GRADE QUALIFICATION

Access to a quality domestic foundry adds critical radiation-hardened manufacturing support for space-grade defense devices. TI's foundry processes include rad-hard manufacturing for devices that must meet the strictest high-reliability standards for space-grade qualifications.

Owning the foundry process allows defense programs to reduce failures and achieve qualification and mission assurance more effectively.

Working with a single foundry partner streamlines multiple supply chain steps under one provider who can manage wafer processing, testing, dicing, and packaging. Packaging includes hermetic and ceramic options for space-grade requirements.

Spirit has decades of experience performing qualification testing workflows to MIL-STD specifications.

Defense satellites and payloads require higher reliability performance thresholds than commercial space components.

Spirit performs testing from wafer- to system-level, from visual inspection to burn-in to radiation testing. Managing both manufacturing and qualification simplifies the supply chain and maintains device control, care, and custody.

PRODUCTION LIFE CYCLE CONTROL

Foundry services allow defense programs to extend control down the supply chain from manufacturing through assembly. Instead of relying on off-the-shelf designs and multiple manufacturers and subcontractors, foundry access reduces the need for multiple suppliers.

Foundry management supports manufacturing prototypes and low-volume high-mix production. Spirit's partnership with TI supports multiple product wafer runs to optimize volume and schedule.

With one supply chain partner managing foundry, packaging, and testing, the production timeline for a device to reach qualification and be ready for the final assembly is significantly reduced to meet more rigorous launch schedules.

FOUNDRY SERVICES SUPPORT CONTINUITY AND SECURITY

Rad-hard foundry services enhance supply chain security and reliability for defense programs in space. As data security and hardware reliability becomes increasingly critical in the competitive space environment, defense satellites and programs will need to adopt more secure technology solutions.

Foundry services, such as the Spirit Electronics foundry services in partnership with Texas Instruments, provide the secure domestic manufacturing control that will help the U.S. achieve technological superiority and safeguard critical space infrastructure. This approach stabilizes production costs and lead times and guarantees availability of legacy technologies.

The ability to secure the supply chain from foundry to assembly enables defense programs to adapt and respond to the increasingly complex challenges of space security.

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Author Marti McCurdy is the owner and CEO of Spirit Electronics and is a veteran of the semiconductor business as well as the United States Air Force. Marti's focus as CEO is to serve the aerospace and defense industry with high reliability supply chain solutions that include component distribution and value-added services. Marti's mission is to bring her high standard of customer service and cultivated relationships to serve the A&D sector.

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