



# LATTICE DEFENSE-GRADE FPGA PORTFOLIO

Lattice Low Power Avant™ Mid-Range Platform and Lattice CertusPro™-NX for reliable operations in extreme environments

## Overview

Lattice’s Defense-Grade FPGA portfolio, featuring Avant and CertusPro-NX, is designed for power-efficient, mission-critical aerospace and defense systems. These devices are available in ruggedized, leaded packages and die attach materials that remain solid at high temperatures and don’t become brittle at cold temperatures as they deliver reliable operation in extreme environments and support military temperature ranges. Extreme temperature reliability is a top concern in Defense and Avionics. Low Power FPGAs directly address this by dramatically improving thermal performance which translate to higher reliability. Integrated security features, including a built-in engine with an embedded Physically Unclonable Function (PUF), provide Differential Power Analysis protection and post-quantum resilience to safeguard sensitive applications.

Lattice FPGAs are trusted in a wide range of aerospace and defense applications, including commercial and military avionics, UAVs and guidance systems, Software Defined Radios, and radar or electronic warfare. Their robust design and advanced security make them ideal for demanding environments where reliability and long-term performance are essential. See table 1.

Table 1: FPGA Portfolio Features

FEATURE	DESCRIPTION
Device Family	Lattice Avant™, Lattice CertusPro™-NX
Ruggedized Package	Leaded (Pb) packages for enhanced reliability in defense/aerospace
Mask Set Control	Ensures silicon consistency and traceability
Assurance	20+ year supply longevity for long program lifecycles
Temperature Range	Military grade: -55°C to +125°C Tj
Testing	Full functional and parametric testing at extreme temperatures
Key Reports	Comprehensive test reports for quality/information assurance
Security	Hardened engine with user data protection, anti-counterfeiting, anti-tamper
Functional Safety	Supports DO-254 compliant solutions

### Lattice FPGA Advantage: Performance, Efficiency, and Security

Lattice Defense-Grade FPGAs deliver industry-leading advantages for aerospace and defense applications. They offer up to 4x lower operating power consumption, 10x smaller package size, and 2x faster serial bandwidth compared to competing solutions. With up to 10x faster configuration times and 100x lower soft error rates, Lattice devices set new standards for reliability and performance. Lattice FPGAs excel at maintaining reliability in extreme thermal conditions. By generating less heat, the device stays cooler which slows failure mechanisms due to overheating or thermal wearout. Advanced security features including crypto agility, quantum-safe cryptography, and root of trust ensure robust protection for mission-critical systems. See figure 1.

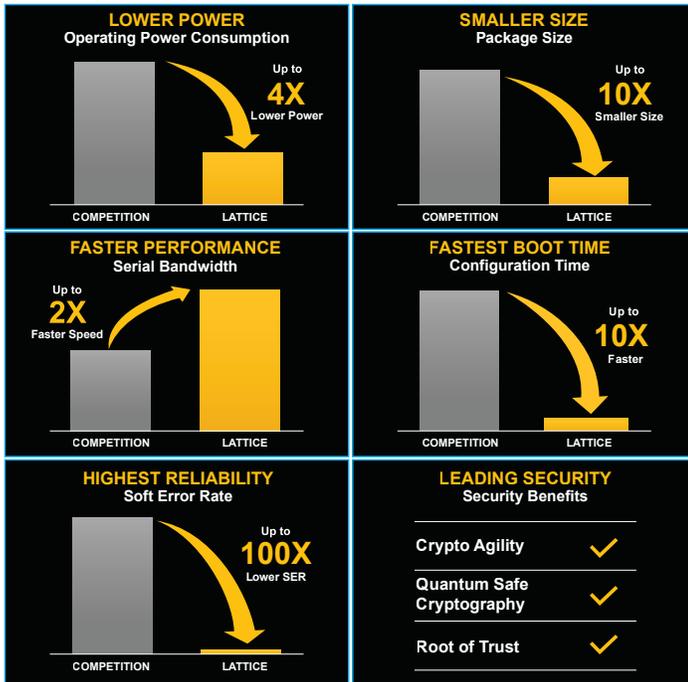
### KEY CHALLENGES

- Reliable operation in extreme temperatures and harsh environments
- Stringent MIL-STD environment tests and DO-254 design assurance
- Secure boot and robust protection against evolving threats
- Durability under high shock, vibration, and prevention of tin whiskers

### LATTICE SOLUTION

- FPGAs tested across the full military temperature range (-55°C to +125°C Tj)
- Ruggedized, leaded (Pb) packaging for enhanced reliability and tin whisker mitigation
- Mask-set control for silicon consistency and traceability
- Extended supply longevity (20+ years) for long program lifecycles
- Advanced anti-tamper features and post-quantum security resilience
- Safe, deterministic operation with a focus on functional safety (supports DO-254 solutions)

Figure 1: Lattice FPGA Advantage



## Reliability and Quality

Lattice FPGAs are engineered for aerospace and defense, withstanding extreme operational stresses and long service life. Only devices passing stringent qualification and testing are approved for these applications.

**Latch-Up Resistant Design:** High temperatures can exacerbate the risk of CMOS latch-up – a condition where a parasitic transistor structure turns on, shorting power to ground and often destroying the chip. Latch-up is more likely when high currents or certain voltage spikes occur, which can be triggered by intense switching activity or radiation events, especially at elevated temperatures. Low-power FPGAs significantly mitigate this because (a) they draw far lower current, so even if a transient condition occurs, it's less likely to inject enough charge to trigger latch-up. Lattice's mature manufacturing process ensures consistent quality and reliability. See table 2.

Table 2: Compliance and Materials Comparison

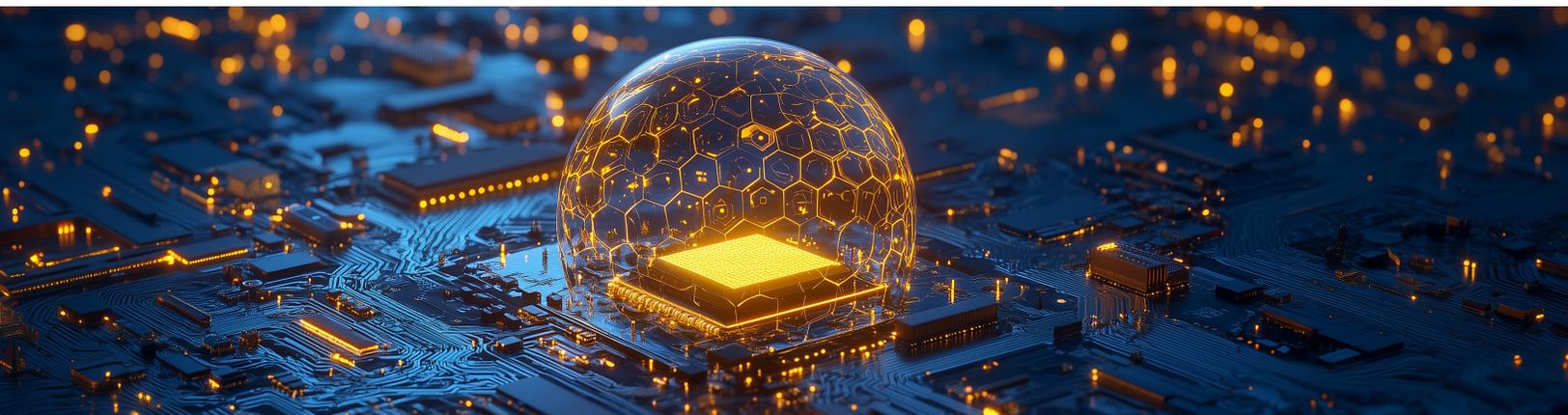
ATTRIBUTE	LATTICE INDUSTRIAL/AUTO	LATTICE DEFENSE GRADE
Device Family	All	Lattice Avant™, Lattice CertusPro™-NX
Package	Lead-free BGA only	MIL-PRF-38535 Pb-content compliant
FPGA	Random Assembly Lot	Random Assembly Lot
Mask Set	N/A	Mask Set Control
Assurance	15+ Year Assured Supply	20+ Year Supply Longevity
Temperature	-40°C to +100°C / +125°C Tj	-55°C to +125°C Tj (Military Temp)
Key Reports	Production Part Approval	Full-range test at extended temperatures
Longevity	15 years	20+ years
Security	Secure boot	Cybersecurity and physical protection

## Conclusion

In conclusion, low-power FPGAs have established themselves as key enablers in the design of defense and avionics that must function from the frigid heights to scorching engine proximities. Lattice delivers a comprehensive portfolio of hardware, software, and IP for aerospace and defense, combining decades of industry partnership with proven reliability, security, and performance. Through adherence to Aerospace standards and demonstrated field reliability, they have earned decades of heritage in engine controllers, flight control systems, and many other platforms. These solutions help reduce risk and accelerate time to market for mission-critical applications.

## Learn More

For more information, visit: [Lattice Defense Solutions](#).



## Ready to Learn More?

To learn more about Lattice low power FPGA-based solutions for industrial, automotive, communications, computing, and consumer applications, visit [www.latticesemi.com](http://www.latticesemi.com) or contact us at [sales@latticesemi.com](mailto:sales@latticesemi.com).

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