



X-ES

NAVIGATING THE CHALLENGES OF DESIGNING FOR A

MULTI-PLATFORM

EMBEDDED COMPUTING SOLUTION

The Challenge

Architecting embedded computing solutions across multiple platforms is never a simple task.

Each separate platform comes with its own considerations that have to be assessed individually, which can be daunting enough without having to make each piece of the puzzle fit together as a whole. Add to that the ever-present need to bring projects to completion on-schedule and on-budget.

Multi-System Complexities

Even after a successful implementation, supporting applications in the field becomes more complex.

Each potential issue is multiplied by the number of different platforms, with the diversity within a project making common solutions difficult to find.

Competing Design Priorities

Factoring the needs of ruggedization into the design phase adds further complications, where balancing the needs of each discrete platform can turn SWaP optimization into a juggling act.

Perfectly consistent and convenient solutions simply aren't possible in these kinds of projects, which can make for difficult decisions on where to prioritize.

The Improvised Solution

When faced with the inherent complexity of deploying to diverse platforms, it's tempting to turn to solutions that look easy on the surface.

The One-Size-Fits-All-Approach

Find a single vendor with a single product that meets every platform's needs

A standard solution, flexibly and creatively deployed, might seem ideal. But making fewer decisions upfront can mean more time and frustration spent on the backend figuring out how to meet the different needs of each platform. Inevitably, this also means paying for functionality you don't need in order to get the functionality that you do.

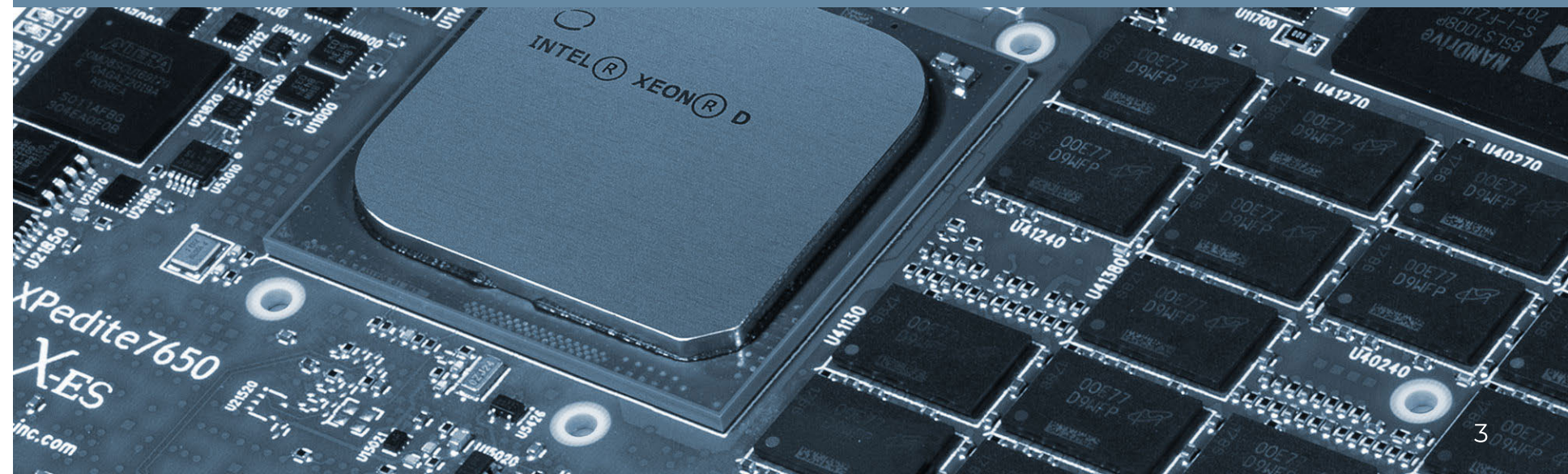
It might even be physically challenging to fit standardized products into the different space allocations available on each platform, leading to improvised accommodations that are unlikely to withstand the environmental conditions that await these systems.

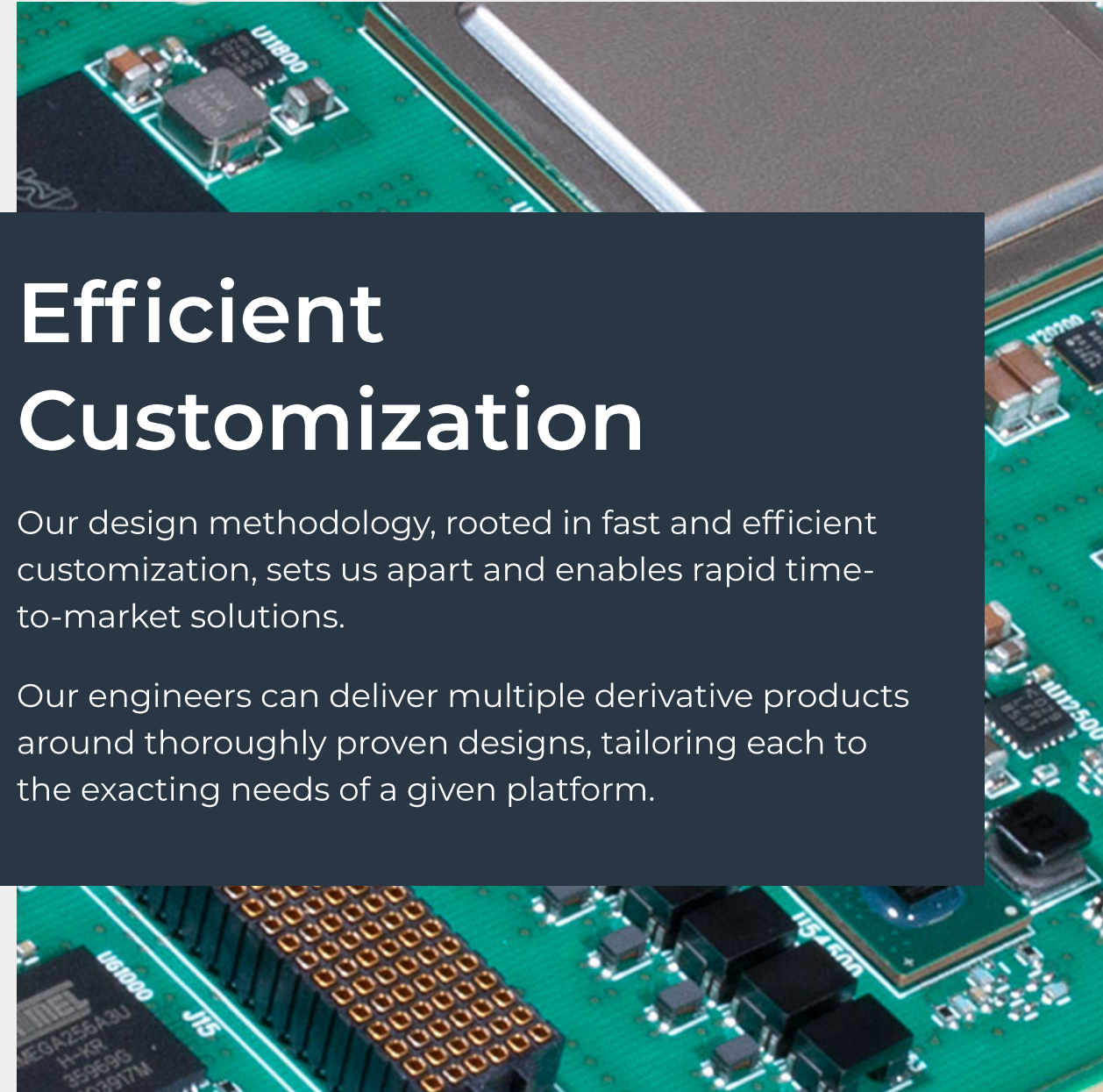
The Pick-and-Choose Approach

Find different vendors, each providing a specific solution for a specific platform

Shopping around across vendors takes more time upfront, and you might expect this due diligence to pay off by providing more targeted solutions. However, the more vendors you work with, the more support overhead you risk adding to the long-term maintenance of your project.

Different vendors means different expectations, different pricing, and different scheduling. Even assuming all the vendors are offering equally competent support, this approach can't help but increase the amount of management and communication needed to solve problems, drawing focus away from the project's core development efforts.





Efficient Customization

Our design methodology, rooted in fast and efficient customization, sets us apart and enables rapid time-to-market solutions.

Our engineers can deliver multiple derivative products around thoroughly proven designs, tailoring each to the exacting needs of a given platform.

The Elegant Solution

Instead of trying to fit square pegs into round holes, why not build round pegs in the first place?

What this means is taking the same considerations you would make after purchase to fit the solutions you've bought into your various platforms, but working those decisions into the design of the solutions themselves.

It means working with a single-source vendor to supply embedded computing products designed to accommodate each discrete platform.

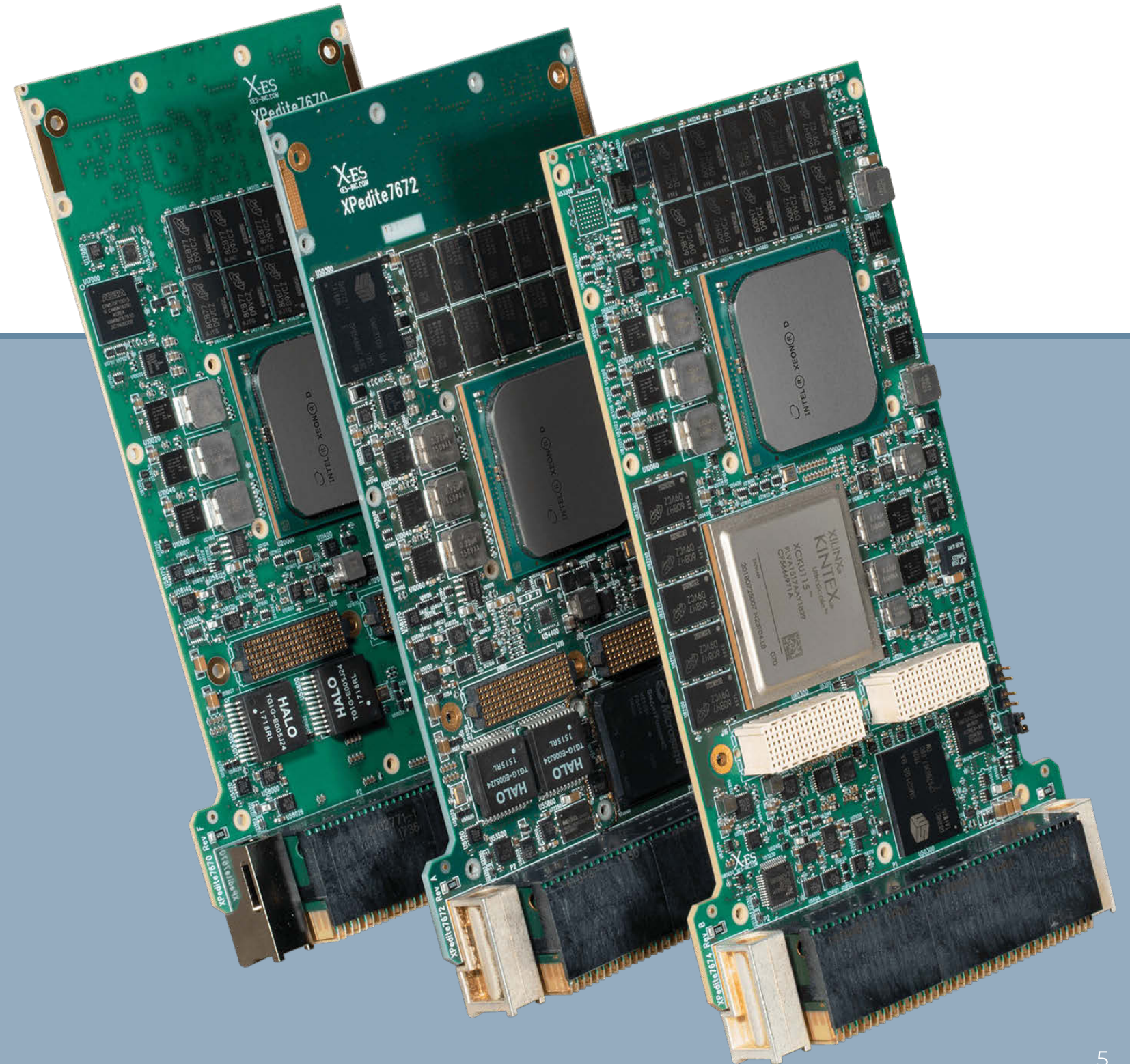
That's where X-ES comes in.

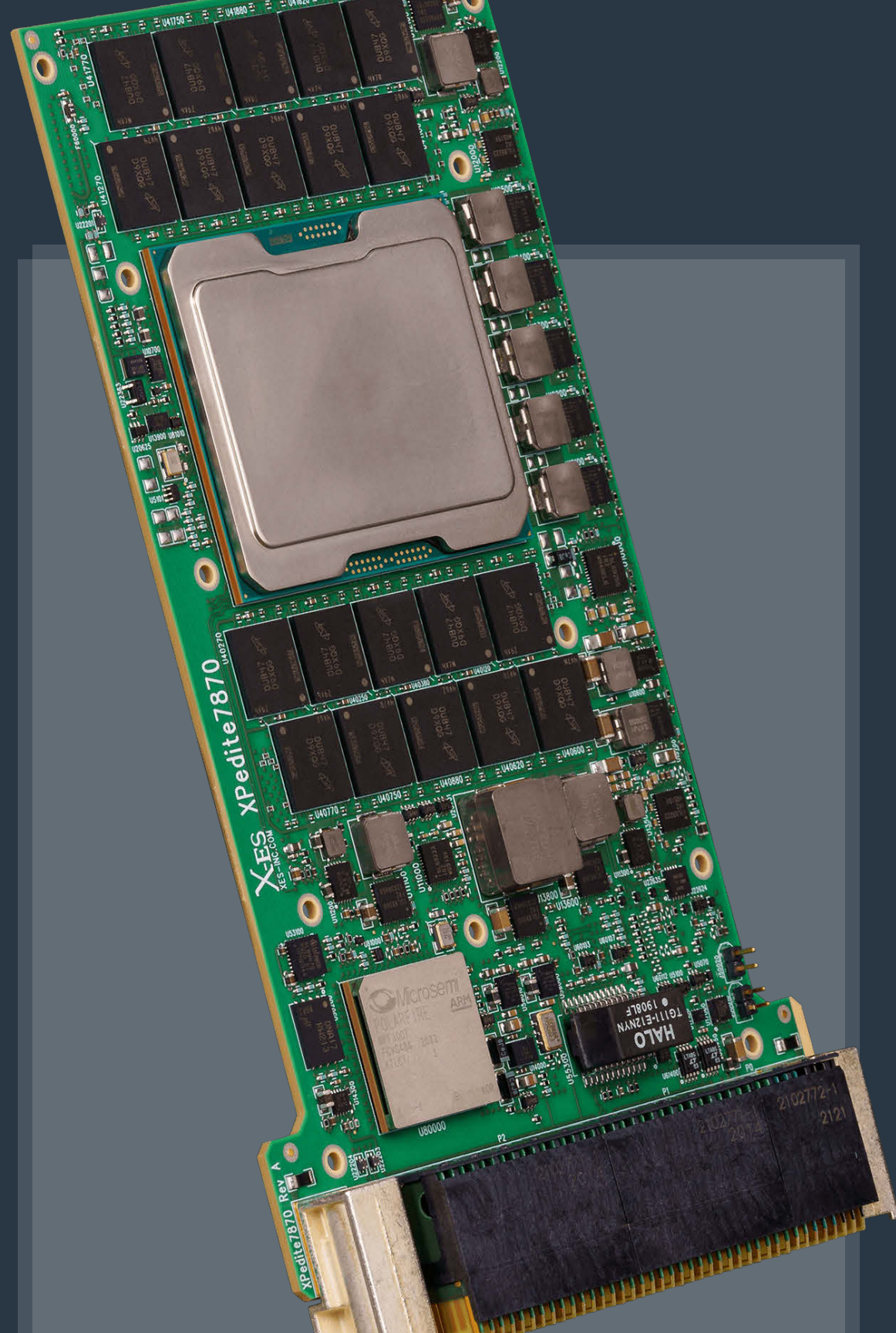
Derivative Design

The X-ES design methodology allows us to carry functionality and features from one industry-standard form factor to another.

- > 3U VPX
- > 3U cPCI
- > XMC/PMC
- > ATCA
- > E-ATX
- > 6U VPX
- > 6U cPCI
- > 6U VME
- > COM Express

X-ES also supports fully custom form factors specifically tailored to meet physical size, shape, space, and weight restrictions.





Advantage: Rugged by Design

Throughout the years, we've spoken with customers who have bought a product from a competitor and then contracted with one or more parties to ruggedize it or tried to figure out how to ruggedize it themselves.

Too often, this can result in improvised solutions — the embedded hardware equivalent of wrapping eggs in bubble-pack — and a lack of clear responsibility for the final product and its performance.

Many of our customers rely on products being able to stand up in extreme conditions in mission-critical situations that can make the difference between safety or disaster. In these scenarios, it pays to choose products that were designed and tested to be rugged in the first place.

Embedded hardware ruggedization is a core competency at X-ES, one of the cornerstones of our identity as a supplier of embedded products and a key differentiator over competitors.

Durable Design

X-ES uses a number of standard features proven to enhance durability and longevity, and for new designs or customizations that are deemed especially risky, we run thermal and structural simulations to predict performance under a variety of expected operating conditions.

Mechanical engineers are involved early in every design, providing an important "reality check" and flagging any issues.

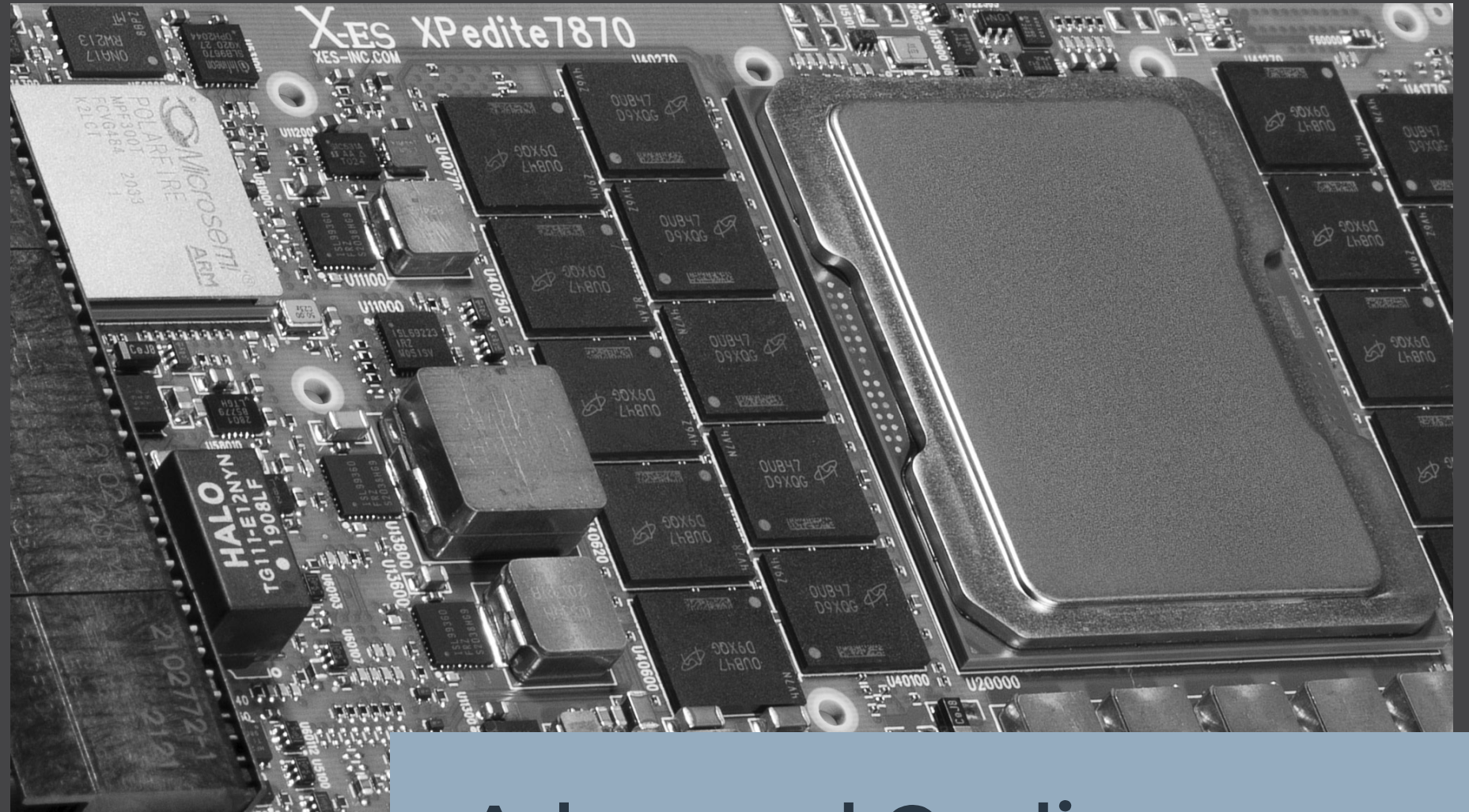


Systematic Testing

All X-ES products undergo a formal acceptance test procedure (ATP), which includes thorough testing of all interfaces.

We also perform environmental qualification testing (EQT) per the product's ruggedization level and acceptance criteria, which typically involves temperature, shock, and vibration testing to the relevant military or industry standards, plus humidity, altitude, or EMI/EMC testing as needed.

As part of the manufacturing process, we complete environmental stress screening (ESS) for every deployable unit delivered, with levels of ESS varying based on customer needs.

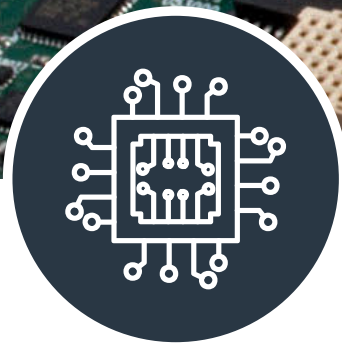
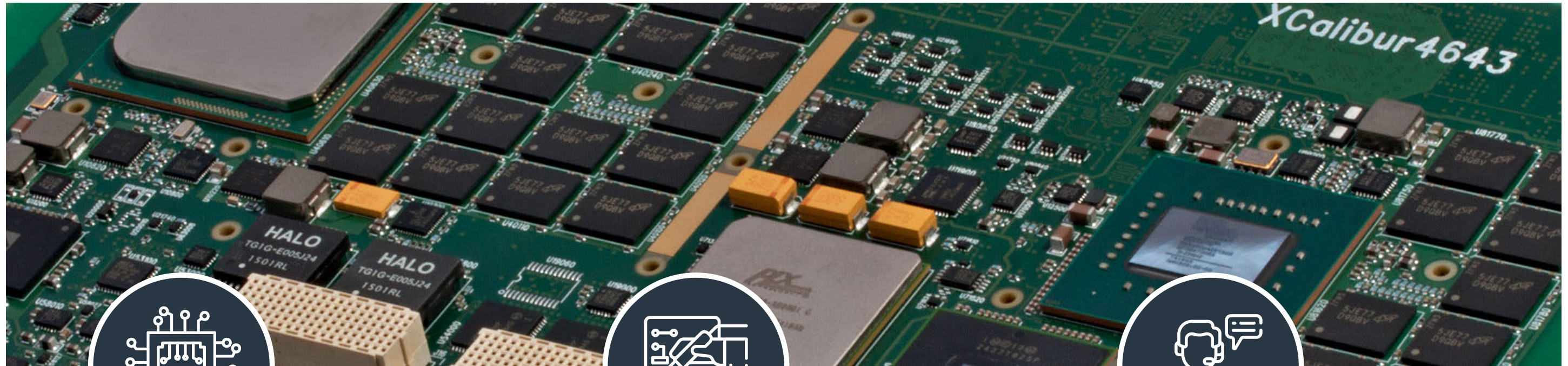


Advanced Cooling

We select an appropriate cooling method for each product based on the operating environment and size requirements.

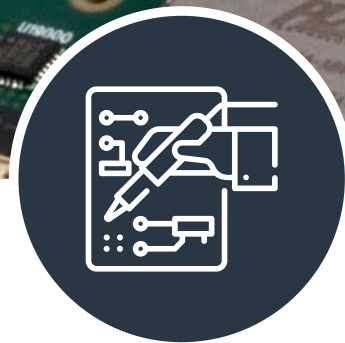
We implement these methods according to the relevant industry standards (for example, VITA 48 for VPX systems) but can also make exceptions for custom and derivative designs.

Advantage: Consistency and Dependability



Engineering

Derivative design allows X-ES and our customers the ability to run a single codeset across multiple applications and deployments for more reliability and interoperability. Reuse of proven functionality also eliminates the risk of introducing new hardware design flaws or software bugs.



Manufacturing

X-ES' extensive expertise in designing ruggedized, deployable solutions ensures an unparalleled level of dependable performance in the field, reducing the likelihood of servicing requirements over the life of the product and reliance on field technicians.



Support

X-ES understands how critical uptime is to our customers, and the frustration that can stem from development delays. Our dedicated team of support engineers provide rapid responses to technical support questions at every stage of your product development.

Advantage: Quick, Efficient, and Cost-Effective

The X-ES approach ultimately makes cross-platform solutions faster to deploy and more cost-effective to operate over the lifecycle of the platform.

With low management overhead and a strong commitment to responsiveness, X-ES can follow up on requests for derivative or custom products in days or even hours, depending on the scope of the project.

Our derivative design methodology cuts down on the guesswork that typically accompanies defining timelines. We can more reliably predict the time it takes to design, build, and test products, allowing us to hit even our customers' most aggressive schedules.

We have even had customers come to us after having issues with a competitor they originally selected. In these situations, X-ES is often able to respond rapidly to requests and make up for lost time.



Here are some typical modifications we've made to fine-tune our products to fit a customer's precise needs for an application:

- Remove unneeded functionality to reduce power consumption
- Add, remove, or move I/O ports
- Add or remove Gigabit Ethernet controllers
- Add or remove FPGA subsystems
- Convert on-card power supplies to different voltage
- Add software support to accommodate hardware customizations
- Combine separate products into a single design

Balanced Customization

Customizing hardware upfront saves on downstream adjustments and accommodations because our products are designed to customer specifications from the very start.

Unlike one-size-fits-all solutions, each product can be tailored for each platform to maximize performance and eliminate feature bloat.

Our proven track record and reliability with regard to ruggedization also reduces the likelihood of needing to warranty or replace products. Combined with industry-leading support, X-ES supplies products built for the entire life-cycle of the application.



X-ES

The Differentiator

X-ES has made its reputation working hand-in-hand with customers to fine-tune and execute solutions, making us a reliable partner to navigate the challenges of projects involving multiple platforms.

By putting the customer in the driver's seat in the design phase, we can supply products that accommodate the platform's needs instead of forcing platforms to accommodate the product's needs.

Our embedded solutions offer a standard and reliable set of tools to work with, allowing you to focus on the end result of your implementation and not the components.

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