



Thermal Management starts early in the Design Process

The applications for electronic devices and systems widely vary. Datacenters are tightly packed with thousands of compute and communications devices and ensuring heat does not adversely affect or permanently damage such elements is vital. Telecom service providers require network elements that will be mounted on poles or in small cabinets in direct sunlight in hot climates. In industrial applications, custom designed circuit cards may be embedded inside machines to offer control or to support communications. The working environment may be at elevated temperatures.

High-speed, high performance electronics generates heat and more specifically certain CPUs or FPGAs or applications specific I.C.s may require heat mitigation. In other circumstances, especially in analog circuitry involved in measurements, electronics must be held at a stable temperature for accurate operation.

AimValley has the experience, knowledge and the tools required to design solutions that manage thermal aspects correctly. Of course applying brute force solutions, for example making overly large circuit boards, using spacious mechanical housings, adding massive cooling fans for maximum airflow, having bulky and expensive heat sinks or even the use of liquid cooled devices is easy, but is all this needed?

AimValley designers have the knowledge and proven experience to make the correct design decisions up front. Optimization in this area balances thermal management versus the size of the solution, cost of the solution and eventually the reliability and performance. AimValley has successfully delivered end to end product-designs that resulted in products that operate permanently where they are attached to poles in direct sunlight in the hot deserts of the Southern US (Arizona, Nevada, California, New Mexico, etc.).

Fanless Product Design

The “easy” solution to manage the heat that is generated inside an electronic product, is to add an electric fan to move hot air out of the product and/ or force cooler air in. However, there are significant downsides to adding cooling fans:

- Electric fans draw current that adds to the overall power budget.
- Fans have moving parts and therefore, they add a more likely point of failure, require service intervals and add to your replacement costs.
- Moving air into and out of product housing, almost always produces audible noise.
- Where there is a concentration of equipment with densely packed electronics, for example data centers, system design considerations and overall air flow must be considered. Otherwise the hot air output of one device may blow into the next.

For these reasons, solution providers desire to have products that do not require cooling fans. Depending on the nature and application of the product, this can often be achieved. Typically, there are one or two integrated circuits within a product that generate most of the heat. Using physical layout techniques coupled with conductive heat transfer/heat flow methods, in other words heat sinks and heat conduits, it is possible to create a design that distributes the heat more evenly.

Our electronic and mechanical design engineers have mastered the ability to design “Fan-less” products, when such designs are plausible. In fact the initial value of AimValley’s design services is to determine if a fan will be mandatory or not. Of course any designers can achieve a fan-less design through trial and error. Where AimValley’s expertise pays off, is through first-pass design considerations to prevent downstream board spins and layout changes.



Ultimately this reduces the cost of the design and brings the product to fruition rapidly.

Why AimValley?

AimValley is a reliable provider of Design Services since 2003, delivering solutions for:

- High speed data processing applications
- Complex FPGA-based accelerated systems
- High speed, low power hardware equipment
- Robust embedded software
- Early adopter of Acceleration Technology

AimValley understands the full complexities as well as the subtle nuances of designing great edge solutions. We excel in building complex systems that are part of your product in the fields of Industry 4.0, Big Data, Healthcare and Transportation markets. Our combined skills represent all the important aspects required for the development of end-to-end systems.

Our customers enjoy the benefits of working with a strong team with more than 2 000 years engineering experience. AimValley is a trusted partner of Tier 1 customers in Telecom and Industrial markets and has shipped more than 100 000 products.

Quality Focus

- Outstanding track record of on-time delivery
- Best in Class Designs – Time, Budget & Quality
- ISO9001, ISO140001, Ecovadis Platinum CSR