

Curtiss-Wright Controls Announces Thermal Management Technology Breakthrough

Curtiss-Wright Controls Electronic Systems has announced that recent testing of its new (patent pending) CoolWall technology for thermal management of rugged embedded computing enclosures has shown a greater than 2x improvement in payload power cooling when compared to traditional aluminum construction. In addition, this breakthrough technology, based on a proprietary mixture of metal composite materials, delivers its dramatically higher thermal conductivity at a weight significantly lighter than aluminum. The ability to thermally manage higher power payloads is critical in leading edge multiprocessing and DSP applications using new products such as VPX where space, weight, and power (SWaP)-constraints are key design hurdles. CoolWall technology can be used both to improve thermal performance and reduce weight. Electronic Systems plans to make this advanced cooling technology available to the embedded market in a broad line of Hybricon® engineered packaging solutions.

Recent test results of CoolWall technology, using the company's baseplate-cooled Hybricon SFF-6 enclosure, showed a 2.4x increase in thermal conductivity at the chassis level (2.4x decrease in sidewall temperature rise) along with a 10% weight decrease as compared to aluminum construction. The initial test results showed a 9°C (approximate) temperature rise of the chassis rails at 67W/slot power dissipation. The CoolWall technology utilizes a mixture of metal composites to deliver enhanced thermal performance combined with the structural characteristics required for rugged applications. The technology comprises a unique thermal metallic composite core housed within a structural metallic composite shell.

"Electronic Systems' Hybricon CoolWall thermal management technology represents a real breakthrough in chassis design," said David Dietz, vice president and general manager of Curtiss-Wright Controls Electronic Systems group. "Using CoolWall, system integrators can achieve maximum performance in a low weight, small form factor rugged enclosure. It significantly outperforms aluminum at similar price-points, and matches copper at significantly less weight and cost. We are just beginning to explore the potential of this important new packaging technology. Electronic Systems plans further refinements to the technology that promise to deliver continual improvements in cooling performance."

Although the initial testing was performed on a prototype enclosure using a cold plate, the use of CoolWall technology is not limited to cold plate applications. It offers the potential to enhance the weight and thermal performance of natural convection-cooled, forced air conduction-cooled, or liquid conduction-cooled chassis through superior heat spreading. To address a variety of requirements, CoolWall technology can be flexibly optimized to modify the balance of its optimization of thermal management or weight reduction.

In addition, CoolWall technology can be used in the design of embedded computing modules to, for example, enhance the thermal performance of conduction-cooled module thermal frames by providing superior heat spreading without the added weight of copper.

About the SFF-6 Chassis

The SFF-6 Small Form Factor Chassis is the newest member of Electronic Systems' Hybricon family of advanced military COTS electronic packaging solutions and features CoolWall thermal technology to support payload heat dissipation up to 400W. This small ATR-style chassis, fabricated using CoolWall technology speeds and simplifies the integration of high performance, 3U OpenVPX or cPCI embedded COTS subsystems designed for use in SWaP-C-constrained military environments.

SFF-6 Performance Features:

- Supports cooling for 6-slot 3U OpenVPX (or 7-slot CompactPCI) 400 W payload
- Patent pending CoolWall technology provides significantly higher thermal conductivity than aluminum at lighter weight.
- ATR-style small form factor baseplate conduction-cooled chassis
- Designed for rugged airborne and ground mobile applications
- Extended temperature, shock & vibration tolerance
- Military power supply for MIL-STD-704F aircraft or vehicle use
- Supports 6-slot OpenVPX, VPX-REDI 1" pitch backplane
- Designed to the latest OpenVPX, VPX and VPX REDI draft specifications
- Custom configurations and integration available

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