

WHITE PAPER

ADVANCEDMC: THE “NEW” LONG-ESTABLISHED SMALL FORM FACTOR ARCHITECTURE

Small Form Factor (SFF) embedded systems have been gaining popularity due to their small Size, Weight, and Power (SWaP). The SFF architectures are typically purpose-built, providing just a few specific functions. The performance level is often limited and the versatility and re-usability across multiple applications is typically very low. Most of the SFF solutions in the market are not based on an open standard. The AdvancedMC (AMC) on the other hand is an open specification that is nearly ½ of the size and weight of Eurocard architectures such as VPX. See Figure 1. It provides significantly more performance than the fledgling open standard concepts for SFF and the AMC form factor has been around for over 10 years.

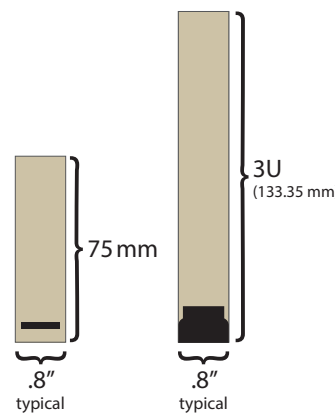
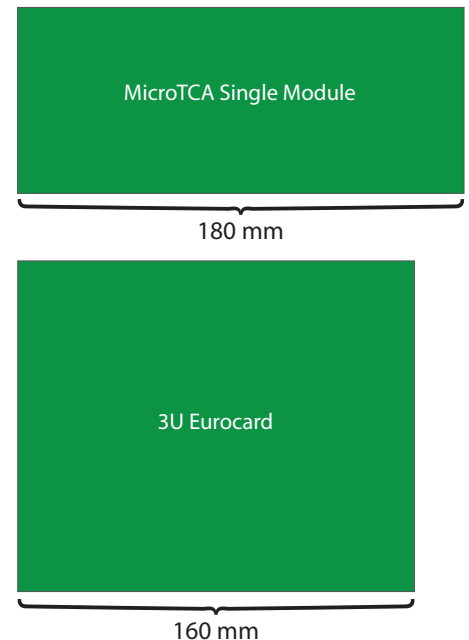


Figure 1

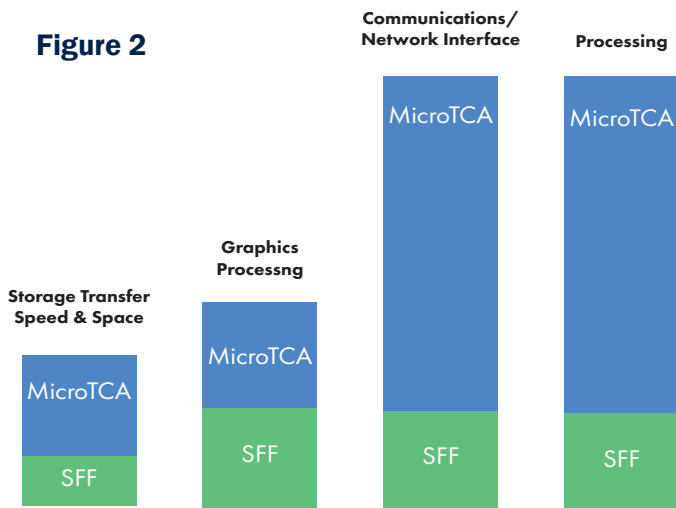


WHY AN OPEN STANDARD?

A large Navy program provided us with a strong lesson in choosing a proprietary solution from one vendor. It backfired when the supplier sold their business unit to a non-allied foreign entity. This would not have been an issue with open standard architectures. There are many benefits to open standards, which include:

- Less Risk – No single source, lower obsolescence risk
- Large Ecosystem – Dozens of vendors and hundreds of products to choose from
- Scalability & Upgrades – Modular design allows easy upgrade path

- Tighter Vendor Competition – Drives innovation, upgrades, and cost reduction
- Leverage Whole Industry – Leverage knowledge, expertise of dozens of vendors
- Tech Re-Use in Multiple Applications – Utilize many of same modules in multiple programs
- More Options – With an open spec, there is always the option to pivot and do it yourself



There are several upcoming SFF concepts, such as VITA 74, that will be a Modular Open Standard Architecture (MOSA). However, these architectures don't offer the performance that AMC's can provide. See Figure 2 for a comparison chart between MicroTCA and the typical open-standard SFF.

In addition, there are multiple proposed MOSA SFF concepts fragmenting the market. Without a consensus choice, many of these proposals will see short lives.

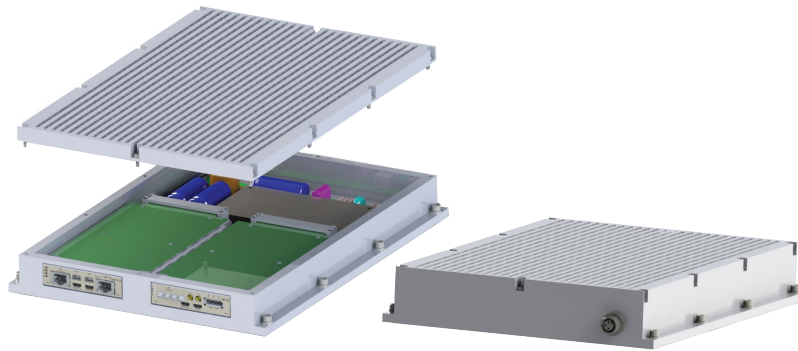
SMALL FORM FACTORS FOR AMC

AMC can be used in both stand-alone systems or in MicroTCA-based enclosures. There are several small MTCA enclosures in various shapes. This includes 1U rugged enclosures, small 1/2 ATRs and Cubes, and Pico-style enclosures. See Figure 3 showing the various types. Pico shelves are a standard option in the core MicroTCA.0 specification. The 2-slot chassis shown (VTS001) is approximately 10" wide for dimensions of 44.5mm high x 250mm x 320mm deep. Often, a MicroTCA Carrier Hub (MCH) is not required in Pico units. The chassis utilizes an active backplane with fan speed control circuitry that is triggered by temperature sensors in the chassis. The IPMI connections are routed to both AMC slots.



Figure 3

Figure 4



Another type of Pico-style enclosure utilizes just AdvancedMCs. The conduction-cooled enclosures in Figure 4 shows the inside and outside of the chassis. The dimensions are approximately 10.5" x 9" x 1.125". Although typically one slot would be used for a processor, this is not always the case. A 2-slot storage solution with network expansion is one application possibility. Also, many of VadaTech's FPGAs have a host PowerPC on-board, so dual FGPA carriers with ADC/DAC or networking FMCs could be incorporated. With the versatility of AMCs, there are virtually limitless configurations available. VadaTech alone offers over 300 AMCs of various types including processors, FPGAs, carriers, graphics, storage, network interface, switches, I/O, and other specialty boards.

APPLICATIONS

Small Form Factor designs are often used in Defense applications. However, they are utilized in several markets including:

- Communications – outdoor and pole-mount edge-of-network
- Energy – power control systems and outdoor platform communication systems
- Industrial – wide range of control systems
- Transportation – wide range of rail and vehicle-mount systems and outdoor communication systems
- Mil/Aero – wide range of airborne, naval and ground vehicle signal processing, storage, and communication systems

Contact VadaTech to discuss your Small Form Factor solution utilizing AMCs today!



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