ASIC
Emulation

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Designing complex systems, from platform level down to ASIC, typically involves a crucial simulation phase to ensure that the proposed architecture achieves the desired functionality and performance. Where implementation is expensive, such as ASIC development, companies will also aim to emulate a design before committing. This step can take roll-out from over twelve months to less than six, with large cost savings and a huge impact on product launch. The more complex the design, the larger the emulation platform needed, driving a constant hunger for larger and faster FPGA-based platforms.

To be effective in this space, highly capable FPGAs need to be configured in a way that provides flexible, high-bandwidth interconnects. Requirements change from one application to another, so a modular architecture is required, preferably based on an open standard and supported by storage and I/O for ease of integration into larger systems. Designers will look for a consistent emulation approach from one product generation to the next, so will prefer platforms that can be upgraded as new technology becomes available.

VadaTech provides a strong range of AMCs based on Xilinx UltraScale and UltraScale+ FPGAs in the AMC59x and AMC58x family. These products not only support the latest and largest FPGAs on the market, including XCVU440, but also offer the connectivity needed to form an emulation network. They are supported by high-performance chassis such as the VT866 and VT884, that offer 40G backplanes and thermal management appropriate for dense, high-power configurations. These are based on industry standard form factors and include intelligent platform management that allows users to easily manage even large groups of platforms.

The platforms VadaTech produces, based on these building blocks, achieve an impressive processing density – up to 12 VXCU440, each supported by 24GB of memory, in a 3U 19" rack mount chassis. Connectivity between the FPGAs can easily be customised to suit particular requirements by changing only the backplane routing. For further detail, see **www.vadatech.com** and **http://www.xilinx.com/applications/asic-prototyping.html**

VT866
5U 12-slot MTCA chassis, 40G backplane

The VT866 provides the power and cooling to support up to 12 full-size AMCs, making it suitable for large, power-hungry FPGAs. The backplane supports 40G links and dual MCH can implement PCIe Gen3, XAUI, SRIO, or low-latency Aurora between the slots.

VT884
3U 12-slot MTCA chassis, enhanced connectivity

The VT844 can house up to 12 mid-size AMCs, each of which can be up to XCVU440 thanks to the advanced airflow design. Supporting PinoutPlus™, the chassis provides up to 160Gb/s between slots in addition to the standard fabric connections.
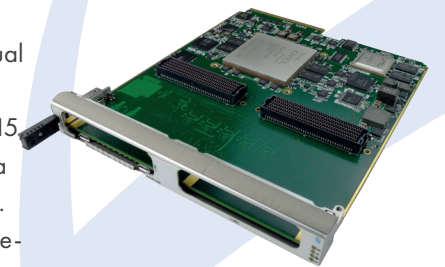
VT835 & ATC126
3U 12-slot MTCA chassis w/ Rugged Blade Processor

The VT835 provides a 40G backplane and allows a very powerful Intel Blade, such as the ATC126, to be coupled to up to 8 AMC59x AMCs, giving users the ability to mix FPGA and GPP technology in their emulation platform.

AMC515
Virtex-7 with FMC Slot
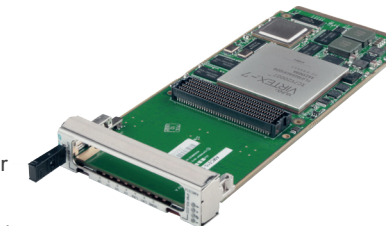
The AMC515 provides an XC7V2000T with P2040 co-processor for local management and up to 2GB of 64-bit wide DDR3. The 200T has almost a million logic cells and over 2,000 DSP slices, supported by GTX (12.5Gb/s) transceivers. It includes a single VITA 57 FMC slot, and offers a lower price/performance point than UltraScale™ modules.

AMC592
Kintex UltraScale™ with FMC Slot

The AMC592 has an UltraScale™ XCKU115 supported by 20GB of DDR4 split over 3 banks (64- and 32-bit wide), giving very high memory bandwidth. It provides a fully-connected VITA 57 FMC slot, making it ideal for implementing external system interfaces at the edge of an emulation network. The KU115 is the largest of the Kintex UltraScale™ FPGAs with over 5,500 DSP slices and GTH (16.3Gb/s) transceivers.

AMC593
Kintex UltraScale™ with Dual FMC Slot

The AMC593 is a dual FMC carrier with an UltraScale™ XCKU115, 8GB of DDR4, and a P2040 co-processor. The board is a double-module size (for the dual FMC slots) so requires a chassis such as VT884 or VT815, and is designed for I/O intensive (edge of emulation network) implementations.

AMC595
Virtex UltraScale™ XCVU440 with FMC Slot

The AMC595 provides an XCVU440, the largest of the Virtex UltraScale™ FPGAs, 8GB of 64-bit wide DDR4, and a P2040 co-processor. The VU440 is well suited to complex ASIC emulation, having 2,880 DSP slices and over 5.5 million logic cells, supported by GTH (16.3Gb/s) transceivers. Note that the FMC slot requires 17.5mm (rather than the more common 10mm) FMC connectors.

AMC596
Virtex UltraScale™ XCVU440 with PinoutPlus™

The AMC596 provides an XCVU440, the largest of the Virtex UltraScale™ FPGAs, 8GB of 64-bit wide DDR4, and a P2040 co-processor. Twenty of the GTH transceivers are routed to the tongue 2 PinoutPlus™ connector, allowing the module to make use of the dense connectivity of VT884. This makes the module ideal for constructing dense meshes of closely-coupled FPGAs, capable of addressing complex ASIC and system emulation tasks.

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