Achronix at a Glance

Company Highlights

- Achronix offers high-performance FPGA solutions and supporting design tools.
- Extensive and proven experience in designing, manufacturing, shipping, and supporting FPGA devices, eFPGA IP and FPGA-based acceleration boards.
- Best-in-class design tools for embedded and standalone FPGA products.
- Development sites in Santa Clara, California (headquarters), Bangalore, India, and Hong Kong, China and sales locations in Shanghai, China, Hong Kong, China, Stockholm Sweden, Munich Germany, Santa Clara, California and Lebanon, New Jersey.

Product Offerings

- Speedster7t® FPGAs are high-performance, high-density FPGAs optimized for artificial intelligence/machine learning (AI/ML) and high-bandwidth workloads, which include a revolutionary two-dimensional network on chip (2D NoC), machine learning processors (MLPs), 400 Gbps Ethernet and PCIe Gen5 ports along with high-bandwidth GDDR6 and DDR4/5 memory controllers.
- Speedcore™ Embedded FPGA (eFPGA) IP is the industry's only silicon-proven, high-density, high-performance eFPGA IP.
- Achronix ® Tool Suite includes ACE, a place, route, and timing analysis and configuration tool for Achronix FPGA designs, Synplify Pro for synthesis and the Snapshot™ debugger. Achronix development environment is compatible with industry-standard simulation tools.
- VectorPath™ Accelerator Cards are designed to reduce time to market when developing high-performance compute and acceleration functions for AI/ML, networking and data center applications.
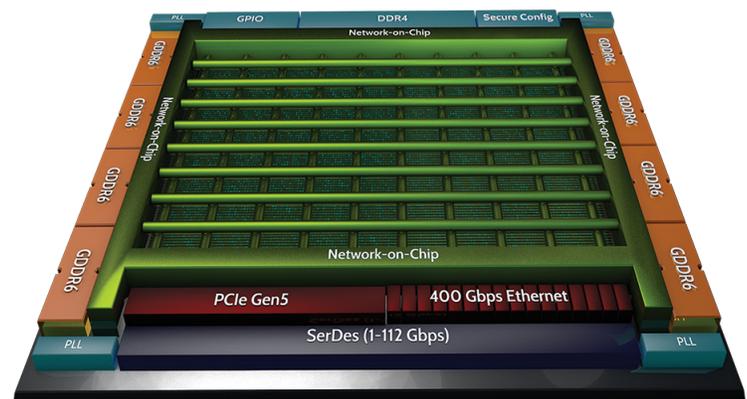
Speedster7t FPGAs

The Speedster7t FPGA family is optimized for compute, networking and storage acceleration for applications such as machine learning and high-bandwidth networking. The Speedster7t architecture eliminates the performance bottlenecks associated with traditional FPGAs. Built on TSMC's 7nm FinFET process technology, Speedster7t FPGAs feature a revolutionary new 2D NoC and an array of new MLPs, optimized for AI/ML workloads.

The 2D NoC is the foundation for extreme data movement on every FPGA in the Speedster7t Family. This data super highway surpasses 20 Tbps of bidirectional bandwidth and interconnects all external I/O, internal interface subsystems and the FPGA fabric itself while consuming no FPGA LUTs or memory.

The MLP blocks are large-scale matrix-vector and matrix-matrix multiplication engines supporting fixed- and floating-point computations. For integer multiplication, each MLP offers 4 × int16, 16 × int8 or 32 × int4 modes. For floating-point and block-floating-point operations, each MLP supports fp15, fp24 or Tensorflow's bf16.

In addition to the 300 Mb of on-chip memory and the 2.6M 6-input LUTs, Speedster7t devices have extremely high-bandwidth interfaces to address high-performance AI/ML requirements including 400G Ethernet ports, PCI Express Gen5 ports for data transfers, plus GDDR6 controllers for interfacing to the industry's most flexible and low-cost, high-bandwidth memory.

Speedster7t FPGAs Deliver Unparalleled Performance for High-Bandwidth Applications
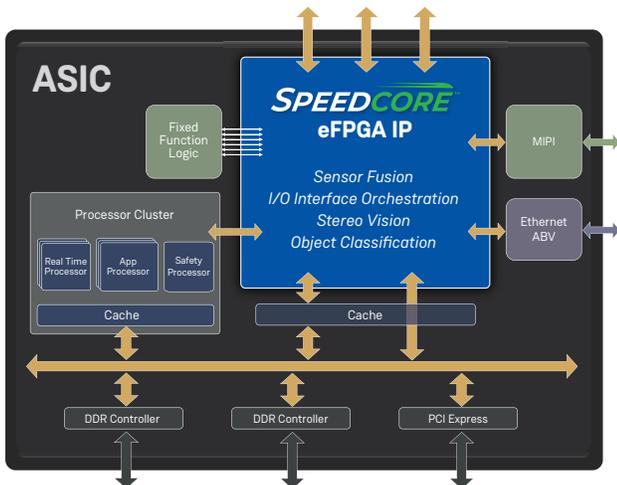
Speedcore eFPGA IP

Speedcore eFPGA IP brings the power and flexibility of programmable logic to ASICs and SoCs. Customers specify their logic, RAM, DSP and MLP resource needed for their applications, then Achronix configures the Speedcore IP to meet these requirements. Speedcore LUTs, RAM, DSP and MLP blocks are assembled like building blocks to create the optimal programmable function for any given application. A personalized version of the Achronix Tool Suite for programming the Speedcore IP is included with the Speedcore IP delivery.

Speedcore eFPGA technology is in production on TSMC 16FFC, 12FFC and N7 nodes with future plans for N5 support. The eFPGA can also be mapped to other foundry processes. Shipping to customers since 2017, Speedcore IP is the only eFPGA technology that has been embedded in high-volume ASICs. More than 10 million cores have been shipped in customers' devices.

There are many benefits to embedding Speedcore technology into an SoC. Compared to a separate, discrete FPGA, Speedcore IP offers :

- 10× higher bandwidth
- 100× lower latency
- 90% lower cost
- 75% lower power

In addition to the straightforward physical advantages of embedding Speedcore technology in complex devices, designers are adding unique, long-term value to their SoC

Speedcore eFPGA IP for Custom SoC Reprogrammable Hardware Acceleration

designs. Speedcore IP cores are serving as reconfigurable coprocessors and hardware accelerators to support a wide range of tasks such SQL offload engines, inline I/O processing, cryptography, search engine algorithmic acceleration and enhanced multimedia processing. Having reprogrammable logic also allows for changes in application or feature specifications. SoCs can also take on multiple personalities through the reprogrammability, allowing for a wider scope of applications using the same SoC.

VectorPath S7t-VG6 Accelerator Card

VectorPath S7t-VG6 Accelerator Card

The VectorPath S7t-VG6 accelerator card is designed to reduce time to market when developing high-performance compute and acceleration functions for AI, ML, networking, storage and data center applications. The card features Achronix's high-performance Speedster7t AC7t1500 FPGA fabricated on TSMC's 7nm FinFET technology. The ×16 PCIe card features QSFP-DD and QSFP56 cages for 400GbE and 200GbE, 16 GB of GDDR6 memory, 4 GB of DDR4 memory and an MCIO connector for additional PCIe connectivity. This accelerator card is well suited for any of evaluation, development, field trials as well as full-volume production requirements.

Achronix Tool Suite

The Achronix Tool Suite is a state-of-the-art tool chain that supports all Achronix hardware products. ACE works in conjunction with industry-standard synthesis and simulation tools, allowing FPGA designers to easily map their designs into Speedster7t FPGAs, and Speedcore eFPGAs.

In addition to ACE, the Achronix Tool Suite includes an Achronix-optimized version of Synplify-Pro from Synopsys and the Achronix Snapshot debugger. Achronix simulation libraries are supported by ModelSim from Siemens EDA, VCS from Synopsys and Riviera-PRO from Aldec.

Achronix®
Data Acceleration