

## Achronix at a Glance

### Company Highlights

- Achronix offers high-performance FPGA solutions and supporting design tools.
- Privately held company founded in 2004.
- Extensive and proven experience in designing, manufacturing, shipping, and supporting FPGA-based IP, devices, and acceleration boards.
- 2016 Arm TechCon “Best Silicon Product” award for Speedcore eFPGA IP.
- Recipient of the 2017 UBM ACE Award for “Company of the Year.”
- Awarded EDN’s Hot 100 Products of 2018 for Speedcore Gen4 eFPGA IP.
- Best-in-class design tools for embedded and standalone FPGA products.
- Locations in Santa Clara, California (headquarters), Bangalore, India and Hong Kong, China.

### Product Offerings

- Speedster7t<sup>®</sup> FPGAs – High-performance, high-density FPGAs optimized for artificial intelligence/machine learning (AI/ML) and high-bandwidth workloads, which include a revolutionary 2D network-on-chip (NoC), new machine learning processors (MLP), 400G Ethernet and PCIe Gen5 ports along with high-bandwidth GDDR6 and DDR4/5 memory controllers.
- Speedcore™ Embedded FPGA (eFPGA) IP – The industry’s only silicon-proven, high-density, high-performance eFPGA IP.
- Speedchip™ FPGA Chiplets – FPGA chiplets optimized for embedding in advanced system-in-package (SiP) solutions such as 2.5D via silicon interposer or organic substrate.
- Achronix<sup>®</sup> ACE Design Tools – Works in conjunction with industry-standard synthesis tools, allowing designers to easily map their designs into Achronix FPGAs.
- VectorPath™ Accelerator Cards – 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.

### Company Overview

Achronix Semiconductor Corporation is a fabless semiconductor corporation based in Santa Clara, California and offers high-performance FPGA solutions. Achronix is the only supplier to have both FPGA and embedded FPGA (eFPGA) solutions in high-volume production.

Achronix’s FPGA and eFPGA IP offering is further enhanced by FPGA chiplets and accelerator cards targeting AI, ML, networking and datacenter applications, plus best-in-class EDA software supporting all Achronix products.

### Award Winning Company and Products

Achronix has received multiple awards for its products including the 2016 Arm TechCon “Best Silicon Product” award for Speedcore eFPGA IP, and later, the 2017 UBM ACE Award for “Company of the Year”, granted to the company exhibiting true leadership in the electronics sector.

In early 2019, Achronix’s Speedcore Gen4 eFPGA IP was recognized as one of the year’s hot 100 products of 2018 by the editorial staff of the EDN Network, selected for being one of the most “significant and useful new developments of the year.”

### Speedster7t FPGAs

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

Acting like a superhighway network running over the FPGA programmable-logic fabric, the Speedster7t NoC supports high-bandwidth communication between interfaces and custom acceleration functions in the programmable-logic fabric. Each MLP is a highly configurable, compute-intensive block, with up to 32 multiplier/accumulators (MACs), supporting integer formats from 4- to 24-bits and various floating-point modes including native support

for Tensorflow's Bfloat16 format as well as the highly efficient block floating-point format which dramatically increases performance.

- 20 Tbps 2D NoC
- 4 Tbps GDDR6 bandwidth
- 300 Mb of on-chip memory
- 2.6M 6-input LUTs

Speedster7t devices have extremely high-bandwidth interfaces that are required to address tomorrow's AI/ML requirements including 400G Ethernet ports, PCI Express Gen5 ports for data transfers plus GDDR6 controllers for the industry's most flexible and low-cost, high bandwidth memory.

## Speedcore eFPGAs

Speedcore eFPGA IP brings the power and flexibility of programmable logic to ASICs and SoCs. Customers specify their logic, RAM and DSP resource needs, then Achronix configures the Speedcore IP to meet their requirements. Speedcore look-up-tables (LUTs), RAM blocks and DSP blocks are assembled like Lego blocks to create the optimal programmable function for any given application. A personalized version of the ACE design tools to program the Speedcore IP is included with the Speedcore IP delivery.

Speedcore eFPGA technology is in production on TSMC 16FF+ and is also available on TSMC's 7nm process technology. Shipping to customers since 2017, Speedcore IP is the only eFPGA technology that has been embedded in high-volume ASICs.

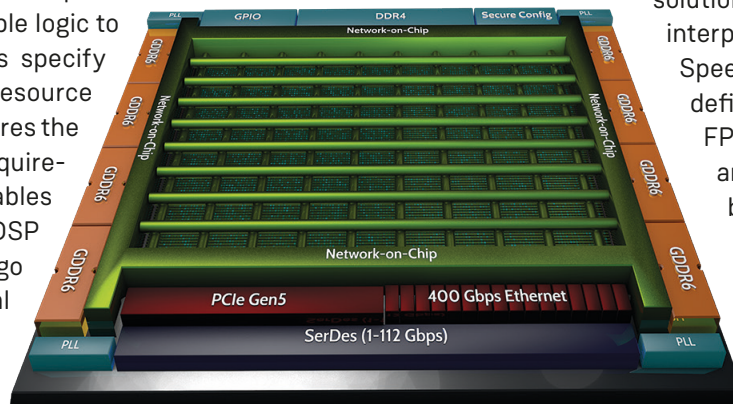
There are many benefits to embedding Speedcore technology into an SoC. Compared to a separate, discrete FPGA, Speedcore IP offers:

- 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 designs. Speedcore IP cores are serving as reconfigurable coprocessors and hardware accelerators to support a wide range of tasks that are significantly more efficient on bit-oriented FPGAs compared to word-oriented CPU architectures. This advantage is evident when integrated within an Arm-based SoC, where the Speedcore eFPGA is a flexible, reconfigurable, workload-specific hardware accelerator, handling functions such as SQL offload engines, inline I/O processing, cryptography, search engine algorithmic acceleration and enhanced multimedia processing.

## Speedchip FPGA Chiptlets

Speedchip FPGA chiptlets are optimized for embedding in advanced system-in-package (SiP) solutions such as 2.5D via silicon interposer or organic substrate. With Speedchip chiptlets, customers define the functionality for their FPGA chiptlet by specifying the amount of LUTs, RAM, DSP blocks and I/O interfaces needed for their application. Achronix then develops the Speedchip chiptlet tailored to the customer's specification, delivering the first samples within 6 to 8 months for integration in a SiP solution.



***Speedster7t delivers unparalleled performance for machine-learning and high-bandwidth applications***

## ACE Design Tools

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

ACE includes an Achronix-optimized version of Synplify-Pro from Synopsys. Achronix simulation libraries are supported by ModelSim from Mentor Graphics, VCS from Synopsys and Riviera-PRO from Aldec.

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