



Speedcore eFPGA IP

Embeddable Fabric

Product Highlights

Speedcore Embedded FPGA (eFPGA) IP – The only eFPGA IP technology shipping in high-volume production applications:

- Customer-defined eFPGA resource counts for logic, embedded memory blocks, MLP and DSP blocks.
 - Logic – 6-input look-up-tables (LUTs) plus integrated wide MUX functions and fast adders.
 - Local RAM – 2 kb per memory block for LRAM2k, and 4 kb per memory block for LRAM4k.
 - Block RAM – 72 kb per memory block for BRAM72k, and 20 kb per memory block for BRAM20k.
 - DSP64 – 18 × 27 multiplier, 64-bit accumulator and 27-bit pre-adder per block.
 - Machine learning processors (MLPs) – 32 multiplier/accumulators (MACs) per block, supporting integer and floating-point formats.
- Achronix delivers the eFPGA IP as a hard macro in GDSII format.
- Speedcore eFPGA IP is available on the following process technology nodes:
 - TSMC 16FFC
 - TSMC 12FFC
 - TSMC N7
- Speedcore performance:
 - Max – 750 MHz
 - Typical – 300 MHz to 500 MHz
- Lowest latency interface:
 - One stage of latency between a Speedcore instance and the host SoC
 - Support for zero-latency interfaces
- Speedcore eFPGA IP is supported by Achronix Tool Suite:
 - Full-featured tools to synthesize, place, route and optimize performance for RTL targeting a Speedcore eFPGA instance
 - Includes Synplify Pro from Synopsys for synthesis
- Easy evaluation:
 - Benchmark designs using Achronix Tool Suite
 - Verify functionality using the VectorPath[®] accelerator card

Power and Flexibility

Speedcore™ eFPGA IP brings the power and flexibility of programmable logic to ASICs and SoCs. Customers specify their logic, RAM, MLP and DSP resource needs, then Achronix configures the Speedcore IP to meet their individual requirements. Speedcore look-up-tables (LUTs), RAM, MLP and DSP64 blocks can be assembled like building blocks to create the optimal programmable fabric for any given application. A personalized version of the Achronix Tool Suite to program the Speedcore eFPGA instance is included with the delivery.

Speedcore eFPGA technology has been in production and shipping to end customers since 2016. Achronix customers include some of the leading technology companies in the world, active in several markets such as telecom, networking, automotive and FinTech. These companies have recognized that Speedcore eFPGA IP is disruptive technology that allows them to dramatically increase the overall performance of their systems.

There are many benefits to embedding Speedcore eFPGA technology into an SoC. When compared to a separate stand-alone FPGA, Speedcore eFPGA IP offers the following:

75%
lower power

90%
lower cost

100×
lower
latency

10×
higher
bandwidth

Proven Technology

The cost and risk of building an SoC is too high to gamble with unproven eFPGA IP. Achronix is the only company shipping both eFPGA IP and standalone FPGAs in high-volume production. Designers can be 100% confident that Speedcore IP will work correctly because it has been fully verified and is silicon proven.



Process Technology

Speedcore IP is available in process nodes TSMC 16FFC, TSMC 12FFC, and TSMC N7. Achronix is working to add more technology nodes. Contact Achronix for more details of the newest technology nodes supported and in development.

Evaluating Speedcore eFPGA

Achronix makes it easy to evaluate Speedcore technology before committing to its deployment in an SoC:

1. Achronix Tool Suite can be used to compile designs with an example Speedcore eFPGA instance to evaluate performance, resource usage and compile times.
2. Achronix uses its Speedcore Die Size Builder to estimate the eFPGA instance size.
3. Evaluation designs can be loaded into the Achronix VectorPath accelerator card to verify functionality and performance.

Speedcore eFPGAs Minimize Footprint, Improve Performance, Lower Power, Decrease Cost and Future-Proof SoC Designs

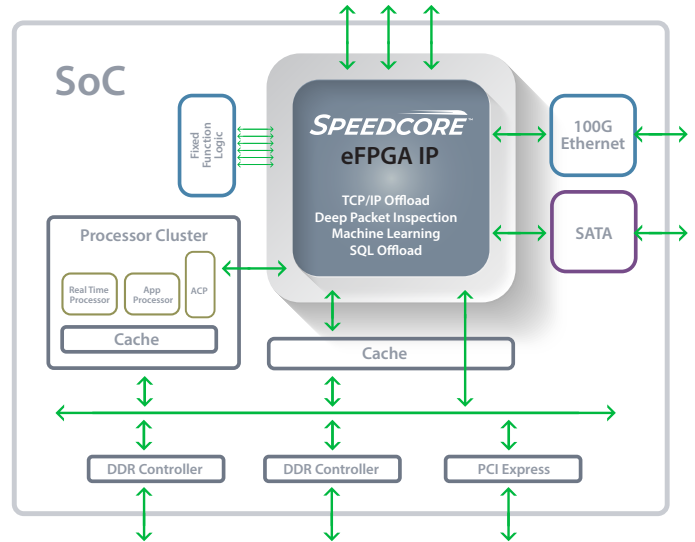
Moreover, Speedcore IP comes with detailed documentation to assist in integrating the technology into your SoC. Achronix also offers several tutorials:

- Benchmarking and evaluation
- Physical design implementation
- Clock-and-reset network design
- Timing closure
- Configuration
- Verification

Speedcore Supports a Range of Applications

In addition to the straightforward physical advantages of embedding Speedcore eFPGA IP in complex devices, designers are adding unique, long-term value to their SoC designs. Speedcore eFPGA instances serve 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 — functions such as SQL offload engines, sensor data pre-processing, cryptographic acceleration, search engine algorithmic acceleration, compression, and enhanced multimedia processing. The range of applications in production or currently being implemented by SoC designers using Speedcore eFPGA IP continues to expand.



About Achronix Semiconductor Corporation

Achronix Semiconductor Corporation is a fabless semiconductor corporation based in Santa Clara, California, offering high-end FPGA-based data acceleration solutions, designed to address high-performance, compute-intensive and real-time processing applications. Achronix is the only supplier to have both high-performance, high-density stand-alone FPGAs and licensed eFPGA IP solutions. Achronix Speedster®7t FPGA and Speedcore eFPGA IP offerings are further enhanced by ready-to-use VectorPath accelerator cards targeting AI, machine learning, networking and data center applications. All Achronix products are fully supported by the Achronix Tool Suite which enables customers to quickly develop their own custom applications.

Achronix has a global footprint, with sales and design teams across the U.S., Europe and Asia. For more information, please visit www.achronix.com.

Achronix Semiconductor – Headquarters
2903 Bunker Hill Lane
San Jose, CA 95054
Tel: 408-889-4100
Email: info@achronix.com
www.achronix.com

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Data Acceleration