MARVELL® FX-14™ CUSTOM ASIC

Performance and power efficiency on silicon-proven technology

Overview

The FX-14 ASIC is a comprehensive semiconductor design system targeted for wired and wireless networking, storage, and cloud computing applications. FX-14 is designed to deliver more performance per watt and use fewer watts per GHz in less space. Compared to its predecessor*, it offers significant power and area savings, including:

· Up to 50% less active power

· Up to 85% less leakage

· Up to 55% less area

This combination of performance, power, and area advantages can help chip designers stay ahead of system-level demands driven by evolving network and data center architectures "and the race to" 5G solutions. FX-14 takes advantage of a production-proven, low-power 14nm FinFET platform from the GLOBAL FOUNDRIES (GF) Fab 8 facility in Saratoga County, NY and years of industry recognized expertise in bringing some of the communications industry's most sophisticated ASICs to life. You can leverage this experience-along with advanced packaging, a rich IP portfolio and an end-to-end, integrated and reliable design methodology-to help you develop differentiated solutions essential to your ongoing market leadership.

Future-Ready IP

The FX-14 IP portfolio features an array of Arm cores and leading-edge high-speed SERDES (HSS), embedded TCAMs and SRAMs. The FX-14 design library provides SoC design flexibility, offering 64-bit Arm embedded processors along with a broad range of 32-bit Arm cores and peripherals. The addition of the 64-bit cores enables designers to optimize their chips for performance in the most demanding communications applications.

An ultra-high-performance 56Gbps long-reach SerDes design extends the GF HSS roadmap. PCI Express (PCIe), a high-bandwidth memory (HBM) interface, and multiple 30Gbps designs are also available. The GF HSS cores provide outstanding jitter performance and qualization over a wide range of interface standards.

The FX-14 TCAM leverages more than 15 years of design experience. Capable of billions of searches per second, the TCAM is one of the fastest, densest and lowest power embedded networking TCAMs in the industry. It utilizes proprietary features for noise mitigation and offers up to 60% better performance and 80% less leakage than its predecessor.*

Highlights

· Industry-leading 60G Long Reach SerDes for next generation systems

· Industry's densest TCAM for embedded networking applications

· High-density SRAM optimized for Machine Learning and Network Applications

· Ultra-low-voltage SRAM and Logic options for energy efficient applications

· Std. Cell Library for power and area efficient MAC implementation in Machine Learning and Artificial Intelligence applications

· Fully integrated Adaptive Voltage Scaling (AVS) ASIC flow

· Comprehensive portfolio of advanced packaging solutions, including MCM, 2.5D Silicon Interposer and qualified 3D TSV process*

· HBM integration with multireticle interposer qualified and in production

Key Features

Features	Benefits
Low supply voltage	• Helps maximize power efficiency.
Multi-Vt design libraries	• For density, power, and performance trade-offs. Custom Std.Cells for MAC optimization in ML and AI applications
Arm cores	• Broad lineup of cores for system-onchip designs, including 64-bit Arm Cortex-A72 and Arm Cortex-A53 processors, and an array of 32-bit Arm cores and peripherals.
HSS	• Wide array of designs for system-level optimization. Offerings include: 56Gbps long-reach design, variety of 30Gbps designs, an HBM interface and PCIe Gen4 support.
Memory compliers	• Array of density-optimized and performance- optimized embedded SRAM memory compilers for design flexibility. Compilers include custom memory arrays for high-performance Arm cores.
	• Cutting-edge embedded TCAM.
	• Embedded ROM, register array and register files.
Packaging	• Comprehensive, advanced packaging

Experience you can rely on

Developed in close collaboration with leading EDA vendors and IP partners, FX-14 is designed to enable first-time-right results in hardware. The design system uses an integrated test-chip-based methodology and a multiphase netlist sign-off process with rigorous entrance and exit milestone requirements.

The comprehensive design methodology takes advantage of industry-standard design tools. It can help reduce optimization costs by enabling the seamless integration of HSS, leading-edge cores, embedded memory, logic elements, I/Os and other proven IP so you can achieve system-level differentiation and get to market faster.

Drawing from a wide portfolio of qualified advanced packaging technologies, our experienced packaging team can help you find the right solution for your product. Deep relationships with the world's leading OSAT suppliers ensure manufacturing excellence and uninterrupted supply.

Multiple ASIC business engagement models enable you to choose how we work together in taking your design from product definition to production. Whether we do it all for you or we collaborate with you, you can be confident that our record of success is working for you. FX-14 design kits are available now. Contact a Marvell representative for more information.