Q4 Company

SiFive Announces Differentiated Solutions for Generative AI and ML Applications Leading RISC-V into a New Era of High-Performance Innovation

10/11/2023

SiFive's Performance P870 and Intelligence X390 product debut sets new bar for high-performance compute in consumer, infrastructure, and automotive applications

SANTA CLARA, Calif.--(BUSINESS WIRE)-- **SiFive, Inc.**, the pioneer and leader of RISC-V computing today announced two new products designed to address new requirements for high performance compute. The SiFive Performance™ P870 and SiFive Intelligence™ X390 offer a new level of low power, compute density, and vector compute capability, and when combined provide the necessary performance boost for increasingly data intensive compute. Together, the new products create a powerful mix of scalar and vector computing to meet the needs of today's dataflow and computation intensive AI applications across consumer, automotive, and infrastructure markets.

The announcement took place at an in-person press and analyst event in Santa Clara today, where the company also provided an update on several of its product lines currently shipping in silicon to customers around the world. Company executives offered insight into SiFive's product roadmap and discussed how the overall RISC-V ecosystem continues to expand rapidly as new applications call for the benefits of RISC-V-based high-performance compute solutions.

"SiFive is leading the industry into a new era of high-performance RISC-V innovation, and closing the gap with other instruction set architectures with our unparalleled portfolio, while recent silicon tape-outs are demonstrating the tremendous benefits of SiFive RISC-V solutions," said Patrick Little, SiFive Chairman, President and CEO. "As the Arm IPO showed, there is a fast-growing demand for semiconductors across many sectors, particularly processors for consumer and infrastructure markets. The flexibility of SiFive's RISC-V solutions allows companies to address the

unique computing requirements of these segments and capitalize on the momentum around generative AI, where we have seen double-digit design wins, and for other cutting-edge applications.

The SiFive Performance P870

Ideal for high performance consumer applications, or when used in conjunction with a vector processor in the datacenter, the P870 core sets an impressive new RISC-V performance bar across instruction set architecture availability, throughput, parallelism, and memory bandwidth. Bringing a 50% peak single thread performance upgrade (specINT2k6) over the previous generation SiFive Performance processors, the P870 is a six-wide out-of-order core, that meets RVA 23 and offers a shared cluster cache enabling up to a 32-core cluster. High execution throughput comes with more instruction sets per cycle, more ALU, and more branch units. The P870 is fully compatible with Google's platform requirements for Android on RISC-V. The P870 also offers additional proven SiFive features:

- x 128b VLEN RVV
- Vector crypto and hypervisor extensions
- IOMMU and AIA
- Non-inclusive L3 cache
- Proven RISC-V WorldGuard security

The SiFive Intelligence X390

Building on the highly popular SiFive Intelligence X280's success in coupling AI/ML applications with hardware accelerators in mobile, infrastructure, and automotive applications, the new X390 brings a 4x improvement to vector computation with its single core configuration, doubled vector length, and dual vector ALUs. This allows quadruple the amount of sustained data bandwidth. With SiFive Vector Coprocessor Interface eXtension (VCIX) companies can easily add their own vector instructions and/or acceleration hardware, bringing unprecedented flexibility and allowing users to greatly increase performance with custom instructions. Features include:

- 1024-bit VLEN, 512-bit DLEN
- Single / Dual Vector ALU
- VCIX (2048-bit out, 1024-bit in)

An Agile Hardware Solution for Generative AI applications

Bringing the P870 high-performance general compute SoC together with a high performance NPU cluster, consisting of the X390 and customer AI hardware engines, offers product designers a highly flexible, low power, and programmable solution with superior compute density for complex workloads.

The company highlighted how interest in these combined SiFive solutions is high, with a number of customers achieving silicon success and in various stages of commercialization using high performance products.

SiFive continues to actively work across the ecosystem (see attached quote sheet) with partners who are ensuring the software, security, and flexibility benefits of the open standard ecosystem are in place for SiFive processors as companies move to commercialize their SiFive-powered products.

About SiFive

As the pioneers who introduced RISC-V to the world, SiFive is transforming the future of compute by bringing the limitless potential of RISC-V to the highest performance and most data-intensive applications in the world. SiFive's unrivaled compute platforms have enabled leading technology companies around the world to innovate, optimize and deliver the most advanced solutions of tomorrow across every market segment of chip design, including artificial intelligence, machine learning, automotive, data center, mobile, and consumer. With SiFive, the future of RISC-V has no limits. For more information, please visit **SiFive.com**.

Stay current with the latest SiFive updates via **Facebook**, **Instagram**, **LinkedIn**, **X**, and **YouTube**.

Supporting quotations from select ecosystem partners:

"We have collaborated with SiFive to deliver Cadence AI-driven digital full flow Rapid Adoption Kits (RAKs) for previous generation SiFive Performance™ and Intelligence™ RISC-V processors and are looking forward to producing them for the upcoming P870 and X390 processors," said KT Moore, vice president of Corporate Marketing, Cadence. "The RAKs utilize our leading Generative AI solutions that optimize power, performance and area while our system verification solutions enable optimal verification throughput and productivity. This empowers SiFive customers to accelerate time-to-market, enhance product quality, and deliver innovative solutions for high-performance computing, AI, automotive, and mobile applications."

"Canonical's strategic alliance with SiFive, a RISC-V CPU IP leader, grants us exclusive privileges, including early access to their cutting-edge processors under development. Canonical has ported Ubuntu to SiFive development systems in the past and is working to have Ubuntu ready at launch with the SiFive HiFive Pro P550 and future platforms," said Cindy Goldberg, Vice President, Silicon Alliances at Canonical. "We see a growing demand for SiFive RISC-V processors and recognize the opportunity across consumer, automotive, and infrastructure markets. Ubuntu is the operating system of choice for infrastructure and cloud use cases. This year, with the introduction of Ubuntu Pro, we have enhanced security, compliance, and support coverage across a broad portfolio of open source software and platform architectures. The combination of SiFive's RISC-V IP and Canonical's software is a

combination that will lead the transformative future in computing, on RISC-V."

"As an early RISC-V adopter and industry leader for delivering production-proven, safety-certified development tools, C/C+ compilers, and operating systems for RISC-V, Green Hills Software is excited to be expanding its close working relationship with SiFive by adding optimized support for the P870 and X390," said Dan Mender, VP of Business Development at Green Hills Software. "Together, Green Hills and SiFive will help companies realize the maximum performance, power, and area benefit possible for these new SiFive offerings."

"IAR welcomes the new SiFive Performance P870 and Intelligence X390 RISC-V processors and recognizes their opportunity for generative AI and ML as well as high-performance computing applications addressing consumer, automotive, and infrastructure. IAR and SiFive have a strong partnership and stand out in the RISC-V ecosystem. SiFive enables IAR with early access its leading commercial RISC-V IP processors while they are under development, enabling co-optimizations benefiting mutual customers. IAR's complete development solution for all the leading RISC-V core IP from SiFive helps embedded software developers around the world maximize the energy efficiency, simplicity, security, and flexibility upsides that RISC-V and SiFive offer, like the latest additions for Generative AI/ML applications." Anders Holmberg, CTO at IAR

"As the world leader in debugging and trace tools used by all major and well-known technology companies, Lauterbach has been committed to supporting the RISC-V ecosystem from the beginning and is a close long-term partner of SiFive, a leading provider of RISC-V CPU IP. Currently, we see a strong growing global demand for RISC-V based processors including generative AI and ML applications as well as high performance compute across consumer, automotive, and infrastructure markets, all markets in which we have been successfully active for many years. Our early access to SiFive's processors under development allows both SiFive and Lauterbach to co-optimize their products for an optimal user experience." Norbert Weiss, Managing Director, Lauterbach GmbH

"SiFive has been instrumental in bringing the RISC-V architecture to Automotive Grade Linux and providing additional hardware options for automakers and suppliers, many of whom are already using the open source AGL platform in production," said Dan Cauchy, Executive Director of Automotive Grade Linux (AGL), an open source project at The Linux Foundation. "SiFive is an active AGL member, and we look forward to their continued collaboration with the broader community."

"The growth of AI and machine learning systems is driving significant compute demands in application-specific processors. Our collaboration with SiFive to provide co-optimized solutions including Synopsys.ai™ full-stack AI-driven EDA suite and Fusion QuickStart Implementation Kits, along with Synopsys Interface and Foundation IP, hardware-assisted verification, and virtual prototyping solutions help mutual customers accelerate the design of high-performance, RISC-V-based SoCs." Kiran Vittal, Senior Director of Partner Alliances Marketing for the EDA Group, Synopsys

Dave Miller

SiFive Corporate Communications

David.miller@sifive.com

Allison DeLeo

Racepoint Global for SiFive

SiFive@racepointglobal.com

Tel.: +1(415) 694-6711

Source: SiFive, Inc.