Freescale announces industry's first 90nm multi-core programmable DSPs in volume production

May 10 2005

Freescale Semiconductor is leveraging its multi-core processor design expertise and advanced process technology to address customer needs for higher signal processing performance at lower power consumption. Freescale, the No. 2 supplier of programmable digital signal processors (DSPs), is the first to manufacture a multi-core programmable DSP on 90 nanometer process technology and bring it into volume production.

Freescale's 90nm MSC8122 and MSC8126 DSPs integrate four StarCore® DSP cores onto a single die. These second-generation multi-core devices are designed to deliver a high-performance, yet cost-effective solution that effectively quadruples performance over single-core DSP offerings. Freescale is focused on reducing the milliwatt per MHz ratio in embedded applications by offering optimal power-to-performance processing solutions. Compared to multi-core microprocessors (MPUs) in the server market that dissipate tens of watts, the low-power MSC812x devices deliver an unmatched 2GHz and 8 giga multiply accumulates per second (GMACs) of DSP processing power while dissipating only 2 watts.

"Freescale's MSC8122 multi-core DSP delivers the performance we need for our next-generation CDMA IP-BSC equipment while enabling us to reduce our cost- and power-per-channel, increase our board density and preserve our software investment," said Mark Borota, Motorola's senior vice president of Cellular Networks.

Embedded system developers are now looking at DSPs, such as Freescale's MSC812x family, as alternatives to higher power, general-purpose MPUs. With four cores running at 500MHz and delivering 2GHz combined performance, these multi-core DSPs are ideal for a wide range of computation-intensive infrastructure applications. Examples include radio network controllers (RNCs), packet telephony media gateways, video multi-conferencing units and high-speed downlink packet access (HSDPA) support for basestations. The processing power of the MSC812x devices also enables the convergence of software-driven applications by offering video, voice, fax and modem capabilities on a single platform.

"The compression, transcoding, and interworking requirements of voice in converged networks have historically been addressed by power-hungry DSP farms," said Sanjay Iyer, senior analyst at The Linley Group. "Freescale's new quad-core MSC8122 and MSC8126 DSPs leverage the advantages of 90nm technology to deliver an unprecedented 8 GMACs of signal-processing performance at a low 2 watts. An array of these devices constitutes a programmable, power-efficient DSP platform that can support a variety of demanding applications, such as transcoding gateways and 3G wireless basestations."

"By offering volume production of our multicore programmable DSPs, Freescale is delivering on our promise to provide embedded systems designers with a high-performance, low-power option to general-purpose single-core DSPs and MPUs," said Lynelle McKay, vice president and general manager of Freescale's Networking and Communications Systems Division. "Our customers need greater processing power with low power dissipation at a cost-effective price point. The MSC812x devices not only deliver exceptional performance but also offer the benefits of 90nm process technology, which enables low core voltage, lower cost and low power dissipation."

The MSC812x DSPs, recently highlighted in EDN's "Hot Products of 2004," offer 1.43 Mbyte of internal memory, a high bandwidth external memory interface, a rich set of advanced peripherals including an 10/100 Mbps Ethernet controller, and high throughput co-processors, all on an optimized architecture featuring Freescale's best-in-class, multi-core system-on-chip (SoC) platform design. The MSC8126 device features a turbo-coding co-processor (TCOP) and Viterbi co-processor (VCOP) to accelerate wireless baseband processing. All MSC812x devices are binary software compatible with single-core MSC711xx and MSC81xx families and pin-compatible with the first-generation MSC8102 device.

The 300MHz and 400MHz versions of the MSC812x DSPs are offered at an extended temperature range of minus 40 to 105 degrees Celsius. The 500MHz version is offered at standard temperature of zero to 90 degrees Celsius.

As a leader in DSP solutions for wireless and VoIP infrastructure applications, Freescale has shipped multiple millions of DSPs based on StarCore technology since the architecture's inception in 2001. Freescale has shipped MSC812x DSPs to more than 20 customers designing VoIP and wireless infrastructure applications.

Freescale is the only supplier of programmable DSP solutions with binary code compatibility spanning from four to 8000+ channels.

Freescale is the No. 2 supplier of DSP products and a global provider of technical support designed to accelerate customers' design cycles and speed time to market. The MSC812x devices are designed to exceed customer expectations for high quality, robustness, programmability and availability of a full service development ecosystem. Freescale offers turnkey software solution with a comprehensive VoIP and wireless transcoding framework. Freescale offers MSC8122ADS and

MSC8126ADS development boards that work seamlessly with the CodeWarrior Development Studio for DSPs based on StarCore technology.

The MSC8122 and MSC8126 devices at 500MHz, 400MHz and 300MHz have passed full industrial qualification and are now available for volume production. MSC812x family unit pricing starts at $127.74 in 10K quantities.