



Press Release

Freehand DSP unveils its Open and Scalable Architecture for Application-Specific Programmable DSP cores

STOCKHOLM, Sweden - October 1st, 2001. Freehand DSP announced today the details of a new architecture for Digital Signal Processing engines that uniquely addresses the demand for scalable functional DSP performance, low power consumption, small silicon area and short time-to-market. The Open and Scalable Architecture, code name "OSCAR", allows the quick and easy design, and implementation as part of System-on-Chip solutions, of Application-Specific Programmable DSP (ASPDSP) cores optimized for a variety of multimedia and communication applications.

Modern multimedia and communication applications are converging, demanding greater amounts of digital signal processing that General Purpose DSP architectures are failing to deliver within aggressive power consumption and cost targets. "SOC designers seeking ways to improve their existing solutions, or to enable new demanding applications, wish to complement or replace General Purpose DSP cores with more specialized processing engines" said Gweltaz Toquet, Freehand's marketing manager. Freehand, who released earlier this year the EchoDSP - industry's first programmable DSP core optimized for echo cancellation - is now offering a powerful and flexible architecture, with associated Intellectual Property building blocks and development tools, that allows chip designers to tailor ASPDSP engines to the requirements of their DSP applications. OSCAR extends Freehand's reach to a wider range of power-constrained applications, including wireless multimedia communicators (e.g. 3G or Wireless LAN terminals) and personal digital assistants (PDAs).

"Freehand offers an interesting new approach to DSP Intellectual Property," said Will Strauss, president of DSP market watcher Forward Concepts. "They have recognized that there is a growing need for specialized DSP processors, and coprocessors for general purpose DSP or RISC cores. Their first product, the EchoDSP core, already addresses an immediate need in the growing VoIP market."

OSCAR uses Freehand's new MicroDSP as a kernel for tailored ASPDSP cores. The MicroDSP is an ultra-small low-power programmable DSP core, designed to efficiently manage up to four tightly coupled accelerators. ASPDSP cores can be created by plugging combinations of accelerators into the MicroDSP, thereby distributing the various tasks of the targeted applications to specialized execution units working efficiently in parallel. The MicroDSP supports general-

purpose DSP and control operations while the "plug-in" accelerators, which can either be hardware extensions to the MicroDSP data-path or programmable slave processing units, accelerate math intensive or special functions. OSCAR not only allows SOC designers to tailor ASPDSP engines with the desired functional performance, but also to fine-tune the hardware and software partitioning of these cores in order to reach the balance of power efficiency, cost efficiency and programmability required to differentiate their solutions.

With a core footprint of only 45K gates, the MicroDSP is industry's most compact low-power programmable DSP core and a perfect fit for low-end communication terminals and other entry-level low-power DSP applications such as digital headsets or hearing aids. For more demanding terminal applications, ASPDSP cores can be tailored by scaling up the MicroDSP functional performance with the addition of accelerators. For communication infrastructure, clusters of ASPDSP cores can be implemented thanks to the MicroDSP's multiprocessing features designed to guarantee both the efficient communication and shared memory usage between cores.

A unique Integrated Development Environment, OSCAR Studio, supports the implementation of the MicroDSP or any configurations of ASPDSP cores and clusters. OSCAR Studio makes it easy to extend the MicroDSP instruction set with new accelerator instructions, automatically supported by the integrated C compiler, assembler, cycle accurate simulator, profiler and debugger. SOC designers can easily describe ASPDSP configurations involving off-the-shelf or custom accelerators, evaluate their efficiency, and optimize application software on the selected configuration. Existing ASPDSP cores can also be re-configured or upgraded as easily, by replacing the existing accelerators or plugging additional ones; most of their existing application software being actually re-useable. OSCAR not only provides SOC designers with the ability to design and implement the breakthrough DSP engines they need in very short time, but it also guarantees a smooth, competitive roadmap to the unpredictable future.

Availability

Revision 1.0 of OSCAR Studio is available immediately, enabling Freehand's customers to evaluate the MicroDSP and investigate ASPDSP core configurations for their applications. The current development environment will be complemented and enhanced by the end of year 2001, with the release of revision 2.0.

The MicroDSP core will be ready to integrate in SOC designs by the end of this year. Two off-the-shelves accelerators, the EchoPlus and VoicePlus respectively supporting echo cancellation (Line Echo Cancellers or Acoustic Echo Cancellers) and voice compression (CELP codecs), will also be available in this timeframe. More accelerators targeted at multimedia and communication applications will be announced during this quarter.

Although Freehand intends to develop a comprehensive portfolio of off-the-shelves accelerators, we also offer customization services. In addition, the OSCAR Acceleration Kit will provide guidelines to assist our customers and third parties in the design of proprietary OSCAR-compliant accelerators.

About Freehand DSP

Freehand DSP AB., formerly known as Freehand Communication AB, is a Semiconductor Intellectual Property (SIP) company, expert in Digital Signal Processing.

Freehand was founded in November 1999 by four entrepreneurs with a long R&D background from the Swedish Telecommunication and Microelectronics industry. The company has since delivered and licensed the EchoDSP, industry's first Application Specific Programmable DSP core optimised for echo cancellation applications.