Fujitsu Laboratories Implements Custom Processor for 3G/LTE Modem with Synopsys' Processor Designer

Custom DSP Reduces Power Consumption by 20 Percent Compared to Other Commercially-Available DSP IP

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Highlights

- Synopsys Processor Designer™ tool enables rapid exploration of processor architectures to optimize for performance, power and area
- Fujitsu Laboratories created a custom DSP with Processor Designer for multi-mode 3G/LTE modem that delivers higher performance than general purpose DSPs with 20 percent lower power
- Software tool chain automatically generated by Processor Designer enables early software development and debugging

Synopsys, Inc. (Nasdaq:SNPS), a global leader providing software, IP and services used to accelerate innovation in chips and electronic systems, today announced Fujitsu Laboratories Ltd. used Synopsys' Processor Designer to design a custom digital signal processor (DSP) for their 3G/LTE multi-mode modem. Traditionally, multi-mode modems have been optimized for power by requiring a hardware block for each mode. By using Processor Designer to develop their own custom-designed DSP, Fujitsu Laboratories was able to develop a processor that handles both 3G and LTE modes and consumes 20 percent less power than other commercially-available DSP IP.

Processor Designer is an automated, application-specific instruction-set processor (ASIP) design and optimization tool that enables the rapid development of custom processors and programmable accelerators. ASIPs are custom processor cores that deliver the best balance of performance and power for their specific application, while offering flexibility through software programming that is not available in fixed hardware blocks. Fujitsu Laboratories used Processor Designer to achieve a simpler and higher performance design for their 3G/LTE baseband processor, using software running on their custom DSP to handle communications processing instead of implementing unique hardware blocks for each signal processing function.

"Developing a high-performance, low power custom DSP for software-defined radio (SDR) demands a solution that provides flexible tools and optimized RTL to achieve increased design productivity and shorter development times," said Makoto Mouri, research manager of ubiquitous platform laboratories, embedded platform division at Fujitsu Laboratories Ltd. "Our success designing our latest custom DSP with Processor Designer confirms its incredible industry track record of producing high-quality and optimized solutions."

Processor Designer's high degree of automation enables design teams to focus on architecture exploration and application-specific processor development rather than on creation and consistency checking of the instruction set simulator (ISS), software development tools, and RTL model. The robustness of Processor Designer's development environment comes from using the Language for Instruction Set Architectures (LISA), a processor description language that incorporates all the necessary processor-specific components such as register files, pipelines, pins, memory, caches and instructions. The LISA language enables Processor Designer to use a single processor specification as the source for the automatic generation of the instruction set simulator and supporting software development tools (assembler, linker, and compiler) as well as the synthesizable RTL for implementation. This level of automation enables a top-down design approach for Fujitsu Laboratories, where they can run behavioral DSP functional simulation before generating RTL code.

"Custom processors offer design teams significant advantages over fixed hardware in DSP and embedded vision applications," said John Koeter, vice president of marketing for IP and systems at Synopsys. "Fujitsu Laboratories' successful custom DSP implementation highlights how Processor Designer enables designers to rapidly explore innovative processor architectures to achieve the best mix of programmability and performance, while greatly reducing their hardware and software development costs."

Availability & Resources

The Processor Designer tool set is immediately available from Synopsys.

o Learn more about Processor Designer http://www.synopsys.com/PD

Synopsys Users Group Japan

Fujitsu Laboratories will be presenting a tutorial on their use of Processor Designer at the Synopsys User Group Japan event in Tokyo, Japan on July 12, 2013. For more information:

http://www.synopsys.com/Community/SNUG/Pages/default.aspx.

About Synopsys

Synopsys, Inc. (Nasdaq:SNPS) accelerates innovation in the global electronics market. As a leader in electronic design automation (EDA) and semiconductor IP, its software, IP and services help engineers address their design, verification, system and manufacturing challenges. Since 1986, engineers around the world have been using Synopsys technology to design and create billions of chips and systems. Learn more at http://www.synopsys.com.

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