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Start-up launches its first power-efficient chip

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February 05, 2007 (IDG News Service) A start-up chip company is introducing a power-efficient processor it has been developing for three years, just as the market clamors for energy efficiency.

P.A. Semi Inc. is offering a dual-core, 64-bit processor Monday that it claims uses only 5 to 13 watts of electricity running at 2 GHz, making it 300% to 400% more power-efficient than other, comparable processors.

The company's performance claims were not independently verified.

P.A. Semi is making its PA6T-1682M PWRfficient processor available to companies that will test it for possible use as an embedded processor in networking equipment for telecommunications, military or aerospace customers, said Dan Dobberpuhl, co-founder and CEO.

The chip is based on Power Architecture technology, which the company has licensed from IBM. P.A. Semi claims that the new product has a better performance-per-watt rating than an IBM 670MP processor, an Athlon 64x2 processor from Advanced Micro Devices Inc. and a Core 2 Duo from Intel Corp. But P.A. Semi won't be directly competing with AMD and Intel because it won't be selling into the server or personal computer markets with its initial product.

P.A. Semi has improved power efficiency through advanced dynamic power-supply regulation, Dobberpuhl said. In older chip design, power coursed through the processor continuously. About 10 years ago, chip designers introduced dynamic power-supply regulation in the processor block to start and stop the flow as needed, a process also called "clock gating." But P.A. Semi gets more granular, clock gating not at the block level, but at the registry level within a block.

"That level of fine-grain clock gating inside the block, no one else has really done," Dobberpuhl said. "In our chips, we have more than 25,000 gated clocks. Most chips that do [block-level] clock gating have maybe a few hundred."

Dobberpuhl was previously a vice president at chip maker Broadcom Corp., which acquired his company, SiByte Inc., in 2000. He also spent 20 years at Digital Equipment Corp. developing microprocessor technology. Other co-founders and executives of Santa Clara, Calif.-based P.A. Semi, which was founded in July 2003, worked with Dobberpuhl at Broadcom or SiByte.

Although the 1682 processor is targeted only at networking equipment, the company plans to eventually introduce other members of the PWRfficient family, including single-core processors that could find a wider market in blade servers and some portable devices.

But even just in networking equipment, the chips could be a big help in energy efficiency, said Richard Wawrzyniak, senior market analyst at Semico Research Corp.

"For all the people who are concerned with their power budget, or they have run out of power budget and they are trying to figure out some way to increase their performance, this makes a lot of sense," Wawrzyniak



said.

Engineering samples of the 1682M sell for \$700 apiece, and an evaluation kit carries a price tag of \$8,500.

Power-efficient operation of servers and other computers has become a top concern of data center managers because of rising energy costs. It has long been a focus of P.A. Semi and its embedded processor development. "We were doing this before it was cool," Dobberpuhl said.