

## MCUs consume 66% less power



Atmel Corporation set new low-power and efficiency standards for ARM Cortex-M4 processor-based microcontrollers (MCUs) with the launch of the [new SAM4L family](#) [1] of devices, based on industry-recognized benchmarks.

Incorporating the company's proprietary ultra-low power picoPower technology used in the hundreds of millions of Atmel AVR MCUs in the market today, the SAM4L family consumes just one-third the power of current solutions.

The Atmel SAM4L family is the industry's first device to provide ultra-low power consumption bundled with unrivaled wake-up times while delivering the highest total application performance in all operating modes.

The SAM4L family consumes down to 90 $\mu$ A/MHz in active mode, lower than any competitor in the market. The new devices are the most efficient MCUs in the market today, achieving up to 28 CoreMark/mA using IAR Embedded Workbench, version 6.40. In sleep mode, the SAM4L devices consume 1.5 $\mu$ A with full random access memory (RAM) retention, and 700nA in back-up mode.

With wake-up times down to 1.5 $\mu$ s from even the deepest sleep modes, the SAM4L family is ideal for battery-powered consumer, industrial and portable healthcare products. The devices take advantage of the numerous Atmel [picoPower](#) [2] power-saving innovations, including SleepWalking, Peripheral Event System, unrivaled wake-up times and intelligent peripherals.

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The Peripheral Event System is a real-time network that allows peripherals to communicate directly with one another without using the central processing unit (CPU). In addition, SleepWalking technology allows a peripheral to qualify and evaluate incoming data without the use of the CPU, eliminating unneeded, power-consuming CPU wake-ups to conserve power. This allows the peripherals to qualify an event and decide to wake-up whether it is from capacitive touch, I<sup>2</sup>C address match or an ADC threshold. The SAM4L devices feature peripherals designed to reduce the overall power consumption such as the innovative LCD controller that include ASCII character mapping, hardware scrolling and blinking support.

“We are excited to integrate our proven AVR picoPower technology into the new SAM4L family of Cortex M4-based devices,” said Alf-Egil Bogen and Vegard Wollan, co-inventors of the AVR architecture, Atmel Corporation. “By incorporating some of the the best technologies of the AVR platform into our new Cortex-M4 MCU portfolio of products, we’re delivering unprecedented low power to the ARM community and a new level of compatibility and familiarity between our two popular microcontroller families.”

“From small battery operated devices to big data centric automated systems, power efficiency is a key element for design success that often hinges on an energy-efficient microcontroller choice such as the Atmel SAM4L MCU. Energy efficiency can no longer be just lowest applications power or even sleep power, the successful MCU for energy-efficient design must innovate less wake time and more efficient applications processing to get to lower power states faster for the greatest overall energy efficiency,” said Tom Hackenberg, principal analyst for MCUs and DSPs, at IHS.

The SAM4L family has two series available, the LS series and the full-featured LC series. There are 48-, 64- and 100-pin package options available in both QFP and QFN.

Atmel’s SAM4L-EK evaluation kit is also available with the SAM4L family to help accelerate designs. The SAM4L-EK includes an embedded debugger, power measurement, LCD, USB and capacitive touch. In addition, the SAM4L-EK measures the current consumed by the MCU through independent circuitry, and displays this in real time. The SAM4L-EK is supported by the [Atmel Studio 6](#) [3] integrated development environment (IDE), which features project examples, debugging support and other resources.

More information about the SAM4L device is available at <http://www.atmel.com/SAM4L> [4]. To see the latest videos, visit the Atmel YouTube Channel at [www.atmel.com/youtube](http://www.atmel.com/youtube) [5] or follow Atmel on [Twitter](#) [6], [LinkedIn](#) [7] or [Facebook](#) [8] for more news.

### Availability and pricing

Engineering samples of the Atmel SAM4L family are available now with production availability in November 2012. Engineering samples in QFP and QFN packages are available in October 2012. The 64-pin WLCSP and 100-pin BGA packages are

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scheduled for January 2013. Pricing for the SAM4L family ranges from \$3.90 to \$4.12 in 1000-piece quantities.

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### **Links:**

- [1] <http://www.atmel.com/sam4l>
- [2] <http://www.atmel.com/technologies/lowpower/default.aspx>
- [3] <http://www.atmel.com/studio6>
- [4] <http://www.atmel.com/SAM4L>
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