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Silicon Labs Introduces World's Most Energy-Friendly USB Microcontrollers

EFM32® Happy Gecko MCU Family Simplifies USB Connectivity for Power-Sensitive, Battery-Operated IoT Applications

AUSTIN, Texas--(BUSINESS WIRE)-- Silicon Labs (NASDAQ: SLAB), a leading provider of microcontroller, sensing and wireless connectivity solutions for the Internet of Things (IoT), today introduced the industry's most energy-friendly USB-enabled microcontrollers (MCUs). The latest addition to Silicon Labs' award-winning EFM32® 32-bit MCU portfolio, the new Happy Gecko MCUs are designed to deliver the lowest USB power drain in the industry, enabling longer battery life and energy harvesting applications. Based on the ARM® Cortex®-M0+ core and low-energy peripherals, the Happy Gecko family simplifies USB connectivity for a wide range of IoT applications including smart metering, home and building automation, alarm and security systems, smart accessories and wearable devices.

A leading supplier of USB bridge chips and smart interface ICs, Silicon Labs developed the Happy Gecko family to address the rising demand for cost-effective, low-power USB connectivity solutions. With more than three billion USB-enabled devices shipping each year, USB is the fastest growing interface for consumer applications and is also gaining significant traction in industrial automation. In today's IoT world, developers have discovered that adding USB interfaces to portable, battery-powered connected devices can double the application current consumption. Silicon Labs' Happy Gecko MCUs provide an ideal energy-friendly USB connectivity solution for these power-sensitive IoT applications.

Happy Gecko USB MCUs feature an advanced energy management system with five energy modes enabling applications to remain in an energy-optimal state by spending as little time as possible in active mode. In deep-sleep mode, Happy Gecko MCUs have an industry-leading 0.9 μA standby current consumption (with a 32.768 kHz RTC, RAM/CPU state retention, brown-out detector and power-on-reset circuitry active). Active-mode power consumption drops down to 130 μA/MHz at 24 MHz with real-world code (prime number algorithm). The USB MCUs further reduce power consumption with a 2-microsecond wakeup time from standby mode.

Like all EFM32 MCUs, the Happy Gecko family includes the Peripheral Reflex System (PRS) feature, which greatly enhances overall energy efficiency. The six-channel PRS monitors complex system-level events and allows different MCU peripherals to communicate autonomously with each other without CPU intervention. The PRS watches for specific events to occur before waking the CPU, thereby keeping the Cortex-M0+ core in an energy-saving standby mode as long as possible, reducing system power consumption and extending battery life.

Happy Gecko MCUs feature many of the same low-energy precision analog peripherals included in other popular EFM32 devices. These low-energy peripherals include an analog comparator, supply voltage comparator, on-chip temperature sensor, programmable current digital-to-analog converter (IDAC), and a 12-bit analog-to-digital converter (ADC) with 350 μA current consumption at a 1 MHz sample rate. On-chip AES encryption enables the secure deployment of wireless connectivity for IoT applications such as smart meters and wireless sensor networks.

The Happy Gecko family's exceptional single-die integration enables developers to reduce component count and bill-of-materials (BOM) cost. While typical USB connectivity alternatives require external components such as crystals and regulators, the highly integrated Happy Gecko MCUs eliminate nearly all of these discretes with a crystal-less architecture featuring a full-speed USB PHY, an on-chip regulator and resistors. Happy Gecko MCUs are available in a choice of space-saving QFN, QFP and chip-scale package (CSP) options small enough for use in USB connectors and thin-form-factor wearable designs.

"Happy Gecko MCUs bring the benefits of Silicon Labs' energy-friendly EFM32 architecture to developers seeking an economical, plug-and-play solution for adding USB connectivity to their battery-powered IoT applications," said Daniel Cooley, vice president and general manager of Silicon Labs' MCU and wireless products. "The combination of Happy Gecko USB MCUs and our Simplicity Studio development environment enables system designers to connect their 32-bit applications to virtually anything with the lowest energy consumption and BOM cost."

Simplifying USB Design

The Happy Gecko family is supported by Silicon Labs' Simplicity Studio development platform, which helps developers simplify low-energy design. The Simplicity Energy Profiler enables real-time energy profiling and debugging of code. The Simplicity Battery Estimator calculates expected battery life based on an application profile, energy modes and peripherals in use. The Simplicity Configurator provides a visual interface for MCU pin configuration, automatically generating initialization code. Code developed for other EFM32 MCUs can be reused with Happy Gecko applications. Developers can download Simplicity Studio

and access Silicon Labs' USB source code and software examples at no charge at www.silabs.com/simplicity-studio.

To help developers move rapidly from design idea to final product, the Happy Gecko family is supported by the ARM® m b e d ™ ecosystem, which includes new power management APIs developed by Silicon Labs and ARM. These low-power mbed APIs are designed with low-energy application scenarios in mind, enabling rapid prototyping for energy-constrained IoT designs. ARM mbed APIs running on EFM32 MCUs automatically enable the optimal sleep mode based on the MCU peripherals in use, dramatically reducing system-level energy consumption. The Happy Gecko starter kit supports ARM mbed right out of the box. Silicon Labs has also launched mbed API support for Leopard, Giant, Wonder and Zero Gecko MCUs. For additional ARM mbed information including access to mbed software, example code, services and the mbed community, visit www.silabs.com/mbed.

Pricing and Availability

The Happy Gecko family includes 20 MCU devices providing an array of memory, package and peripheral options, as well as pin and software compatibility with Silicon Labs' entire EFM32 MCU portfolio. Samples and production quantities of Happy Gecko MCUs are available now in 24-pin and 32-pin QFN, 48-pin QFP and 3 mm x 2.9 mm CSP packages. Happy Gecko MCU pricing in 10,000-unit quantities begins at $0.83 (USD). The Happy Gecko SLSTK3400A starter kit is available now and priced at $29 (USD MSRP). For more information about the Happy Gecko MCU family and to order samples and kits, please visit www.silabs.com/Happy-Gecko.

Silicon Labs

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