Silicon Labs Packs Precision Analog Performance into Tiny 8-Bit Microcontrollers

New EFM8LB1 Laser Bee MCU Family Delivers Speed, Accuracy, Cost-Saving Integration and Small Footprint for Optical Modules

“As a leading supplier of 8-bit MCUs for the optical module market, Silicon Labs is dedicated to meeting customer needs for higher analog performance, smaller form factors and lower BOM cost achieved through single-chip integration”

AUSTIN, Texas--(BUSINESS WIRE)--Silicon Labs (NASDAQ: SLAB) has introduced a new microcontroller (MCU) family that delivers the highest analog performance and peripheral integration in the 8-bit market. The latest addition to Silicon Labs’ EFM8 MCU portfolio, the new EFM8LB1 Laser Bee MCUs combine a high-speed analog-to-digital converter (ADC), multiple digital-to-analog converters (DACs), a highly accurate temperature sensor, two comparators and a 72 MHz 8051 core with up to 64 kB of flash. Laser Bee MCUs deliver their powerful analog sting in a tiny 3 mm x 3 mm QFN package, making them a good fit for space-constrained, performance-intensive applications such as optical modules, test and measurement instrumentation, industrial control equipment and smart sensors.

For more details about Silicon Labs’ EFM8LB1 Laser Bee family, development tools and the EFM8 MCU portfolio, visit www.silabs.com/EFM8.

The EFM8LB1 Laser Bee MCU family is well suited for high-speed, analog-intensive optical transceiver modules, which are widely used in telecom and data communications. Optical module applications require small-form-factor MCUs offering exceptional analog performance and integration. The EFM8LB1 family’s high degree of analog integration helps eliminate the need for external analog components, reducing the overall system bill of materials (BOM) cost and printed circuit board (PCB) space while enhancing performance. For example, Laser Bee MCUs integrate up to four 12-bit DACs, eliminating the need for four external DACs typically required by optical modules.

The Laser Bee MCU’s on-chip 14-bit, 900 ksps ADC includes an input sequencer and direct memory access (DMA) controller, enabling raw data collection without MCU intervention. This capability frees the MCU for other tasks, providing an increase in overall system performance while enabling the MCU to enter a low-power mode for energy-saving benefits. In addition, the MCU’s 72 MHz pipelined 8051-based 8-bit core can execute more than 70 percent of instructions in 1 to 2 clock cycles, satisfying the processing needs of high-speed optical modules and other computationally intensive applications.

EFM8LB1 MCUs integrate four configurable logic units (CLUs), enabling designers to implement combinational logic and/or synchronizers without using external components. The industry’s smallest CLU implementation, the logic units support a variety of digital functions such as replacing system glue logic, generating special waveforms or synchronizing system event triggers. Each CLU is completely programmable, making it easier to interface Laser Bee MCUs with other chips in the system. By reducing the component count and PCB space required to support glue logic, the logic units ultimately minimize BOM cost and time to market.

Many precision analog applications include sensors or other components that require temperature compensation. For example, laser drivers and other components in optical modules are sensitive to temperature variations. To maintain constant communication data rates, optical modules must precisely measure module temperature and adjust the laser power accordingly. If an MCU lacks an accurate temperature sensor, it is necessary to calibrate the module temperature during manufacturing, which is costly in terms of manufacturing time and equipment. Laser Bee MCUs address this need with a built-in, factory-calibrated ±3°C accuracy temperature sensor, enabling very accurate temperature measurement without any customer calibration.

“As a leading supplier of 8-bit MCUs for the optical module market, Silicon Labs is dedicated to meeting customer needs for higher analog performance, smaller form factors and lower BOM cost achieved through single-chip integration,” said Daniel Cooley, vice president of marketing for Silicon Labs’ IoT products. “Our Laser Bee MCUs provide a next-generation 8-bit solution for optical module developers who need precision analog capabilities backed by comprehensive hardware and software development tools.”

Simplifying Application Development

Silicon Labs simplifies 8-bit development with native support for EFM8LB1 Laser Bee MCUs within the Simplicity Studio development platform. Simplicity Studio streamlines the process of developing IoT applications by providing MCU and wireless developers with one-click access to everything they need to complete their projects, from initial concept to final product, in a unified software environment. Simplicity Studio includes an Eclipse-based integrated development environment (IDE), graphical configuration tools, energy profiling tools, network analysis tools, demos, software examples, documentation, technical support and community forums.

Pricing and Availability

Samples and production quantities of the EFM8LB1 Laser Bee MCUs are available now in a choice of QFN24 and QFN32 packages. EFM8LB1 product pricing in 10,000-unit quantities begins at $0.52 (USD) and varies depending on peripheral features, amount of RAM (ranging from 1 kB to 4 kB) and amount of flash memory (scaling from 16 kB to 64 kB).

To simplify application development using Laser Bee MCUs, Silicon Labs offers the SLSTK2030A EFM8LB1 starter kit with software demonstrations showing how the MCUs can perform temperature and voltage measurements as well as highlighting ADC and DAC capabilities for oscilloscope and function generator applications. The SLSTK2030A starter kit is available now and priced at $29.99 (USD MSRP). Order EFM8LB1 Laser Bee samples and starter kits at www.silabs.com/EFM8.

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