Silicon Labs Reference Design Helps Developers Get Motors Spinning in Less Than Five Minutes

November 6, 2013 1:00 PM EST

Comprehensive Sensorless Brushless DC Motor Control Solution Eases Application Development, Speeds Time to Market

AUSTIN, Texas--(BUSINESS WIRE)-- Silicon Labs (NASDAQ: SLAB), a leader in high-performance, analog-intensive, mixed-signal ICs, today introduced a brushless dc (BLDC) motor control reference design featuring ready-to-use hardware and software for sensorless BLDC applications using Silicon Labs' C8051F85x/6x microcontrollers (MCUs). Silicon Labs' new reference design provides a comprehensive, system-level solution that accelerates embedded development for a wide range of motor control applications including remote control helicopters, motorized toy cars, electronic speed controllers, PC and electric fans, electric tools such as cutters, shears, mowers, nail guns and staplers, and small appliances such as mixers, grinders, toothbrushes and vacuum cleaners.

As embedded system designs continue to increase in complexity and development schedules grow tighter, reducing development time is a key consideration in MCU selection for motor control applications. The C8051F85x/6x MCU-based motor control reference design makes the developer's job easier by providing cost-effective hardware and production-quality firmware for quick evaluation and deployment in cost-sensitive BLDC applications. In addition, the motor control graphical user interface (GUI) gives developers greater flexibility and ease-of-use when controlling and understanding BLDC motor operation, and access to production-ready motor control source code helps to expedite the design-in time.

The sensorless BLDC motor control reference design uses a C8051F850 MCU to control a BLDC outrunner motor (typically found in toy helicopters) mounted on the motor mount board. The powertrain board contains gate drivers, power MOSFETs, a current sensing resistor as well as resistor dividers to attenuate motor phase voltages so that they can be measured by the C8051F85x/6x MCU. The MCU board contains a C8051F85x/6x MCU, as well as buttons to start/stop and change motor direction and reset the MCU. The MCU's PWM output drives the gate drivers on the powertrain board. The MCU board also contains an operational amplifier (op-amp) to amplify the current sensing voltage so it can be measured by the MCU.

The C8051F85x/6x family is ideally suited for BLDC applications because of its best-in-class analog performance, small footprint and other features optimized for motor control designs. The cost-effective, high-performance 8051-based MCU spins the reference design kit's 6-pole motor at a maximum speed of 50,000 rpm. The C8051F85x/6x MCU family also helps developers reduce overall system cost by eliminating the need for external components such as a crystal oscillator, voltage reference, level shifters, temperature sensor and other discretes.

Silicon Labs' sensorless BLDC reference design is designed to give developers a productive, comprehensive "out-of-box" experience, providing everything needed to get a motor spinning in less than five minutes. The reference design includes the following hardware and software tools:

- C8051F850 MCU control board providing the intelligence to drive the motor and associated peripherals
- Powertrain board with gate drivers and power MOSFETs
- Turnigy 450 Series 3800 kV BLDC outrunner motor attached to a motor mount board
- CD with application notes, production-ready motor control firmware source code and software tools including a motor control GUI
- Complimentary Keil® PK51 development software with unrestricted license (an approximate value of $2,500 USD)
- Power supply and USB cable

"Rapid application development, reduced system cost and fast time to market mean everything to embedded developers working on cost-sensitive motor control designs," said Diwakar Vishakhadatta, vice president and general manager of 8-bit MCU products at Silicon Labs. "We created our sensorless BLDC motor control reference design to help make the developer's job easier and more productive and to highlight the significant benefits in designing BLDC systems based on our popular C8051F85x/6x MCUs."

Pricing and Availability

Silicon Labs' C8051F850-BLDC-RD motor control reference design is available today and priced at $164.99 (USD MSRP). Samples and production quantities of Silicon Labs' C8051F85x/6x MCUs are also available now. MCU pricing in 10,000-unit quantities begins at $0.40 (USD), and high volume pricing starts at $0.30.

For additional information about the sensorless BLDC motor control reference design and to order MCU samples and download complimentary Keil development tools, please visit www.silabs.com/smallmcu.

Silicon Labs

Silicon Labs is an industry leader in the innovation of high-performance, analog-intensive, mixed-signal ICs. Developed by a world-class engineering team with unsurpassed expertise in mixed-signal design, Silicon Labs' diverse portfolio of patented semiconductor solutions offers customers significant advantages in performance, size and power consumption. For more information about Silicon Labs, please visit www.silabs.com.

Cautionary Language

This press release may contain forward-looking statements based on Silicon Labs' current expectations. These forward-looking statements involve

risks and uncertainties. A number of important factors could cause actual results to differ materially from those in the forward-looking statements. For a discussion of factors that could impact Silicon Labs' financial results and cause actual results to differ materially from those in the forward-looking statements, please refer to Silicon Labs' filings with the SEC. Silicon Labs disclaims any intention or obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise.

Follow Silicon Labs on Twitter at http://twitter.com/silabs and on Facebook at http://www.facebook.com/siliconlabs.

Explore Silicon Labs' diverse product portfolio at www.silabs.com/parametric-search.

Silicon Labs
Dale Weisman, +1-512-532-5871
dale.weisman@silabs.com

Source: Silicon Labs

News Provided by Acquire Media