Silicon Labs Launches Best-in-Class Capacitive Sensing Microcontrollers for HMI Applications

C8051F97x MCU Family Enables Longest Battery Life and Highest Performance in 8-bit Touch Control Market

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AUSTIN, Texas--(BUSINESS WIRE)--Silicon Labs (NASDAQ: SLAB), a leader in high-performance, analog-intensive, mixed-signal ICs, today introduced the industry’s most energy-efficient capacitive sensing microcontrollers (MCUs) for human-machine interfaces (HMI). The new C8051F97x MCU family combines Silicon Labs’ proven ultra-low-power technology with the industry’s fastest, most accurate capacitive sensing to provide a best-in-class touch control solution for the Internet of Things, home/building automation, consumer and industrial markets. The F97x MCUs target battery-powered and capacitive touch sensing applications for handheld industrial devices, toys, gaming machines and remote controls, as well as touch-panel switch replacements for white goods such as washers, dryers, ovens and dishwashers.

Silicon Labs’ F97x MCUs offer the industry’s lowest energy consumption in active, sleep and deep-sleep modes, enabling the longest battery life of any 8-bit capacitive sensing MCUs. With 200 µA/MHz active current, the F97x MCUs provide an ideal combination of low energy consumption and excellent system performance. The MCUs’ fast two-microsecond wake time minimizes energy consumption while transitioning from sleep to active mode. The F97x MCUs offer the lowest sleep mode energy consumption in their class: 55 nA sleep current with brownout detector enabled and 280 nA sleep current with a 16.4 kHz internal oscillator.

The F97x MCU family offers industry-leading capacitive sensing technology with sub-micro-amp (<1 µA) wake-on-touch average current, 16-bit resolution and unmatched 100:1 dynamic range to support buttons, sliders, wheels, and capacitive proximity sensing with up to 43 channels and multiple scanning modes. The F97x MCUs incorporate Silicon Labs’ SAR charge-timing capacitance-to-digital converter (CDC) technology. The high-resolution CDC’s 40-microsecond acquisition time enables the industry’s fastest capacitive touch-sense capability without sacrificing sensitivity performance.

Silicon Labs’ CDC technology offers superior noise immunity for reliable performance in challenging conditions and configurations such as thick laminate overlays, electrical noise or variances in printed circuit board (PCB) manufacturing. This advanced CDC hardware implementation is capable of measuring capacitance on a wide range of materials including PCBs, flex circuits, and indium tin oxide (ITO) on glass and film.

The F97x MCU family expands the capabilities of Silicon Labs’ popular C8051F99x low-power capacitive sensing MCUs with up to 43 capacitive sensing inputs, 32 kB flash memory, 8 kB RAM, seven DMA channels and a 16 x 16 multiply-accumulate (MAC) unit in QFN packages as small as 4 mm x 4 mm. The F97x MCUs integrate a 25 MHz pipelined 8051-compatible core, a precision oscillator, a 10-bit analog-to-digital converter (ADC), a temperature sensor, a voltage reference and four 16-bit general-purpose timer/counters.

“The touch interfaces for our HVAC, lighting and security devices require fast and accurate capacitive touch control and complex system management, all within a very tight power budget, and Silicon Labs’ F97x MCUs provided the most energy-efficient solution without any performance or functional trade-offs,” said John Calagaz, chief technology officer of CentraLite Systems. “Silicon Labs’ Simplicity Studio development platform also helped us meet our time-to-market targets, providing everything we needed to optimize our design for performance and energy efficiency.”

The F97x MCU family is supported by the Simplicity Studio development platform, which enables developers to quickly demonstrate and develop capacitive touch interfaces. This complimentary software platform includes a fully integrated Eclipse-based integrated development environment (IDE), a Keil compiler (supporting unlimited code size), demonstration tools, application examples, libraries and documentation in a single, simple-to-use tool. The built-in Capacitive Sense Profiler tool greatly simplifies the fine tuning of buttons, sliders, wheels, touch pads and proximity sensors. A full-featured capacitive sense firmware library makes development fast and efficient and ensures robust, proven operation.

“Many of today’s battery-powered connected devices for the IoT require high-performance yet energy-friendly touchscreen user interfaces. We understand the requirements of these applications and have delivered a best-in-class capacitive touch sensing solution for the IoT market,” said Daniel Cooley, vice president and general manager of Silicon Labs’ microcontroller and wireless products. “Combining industry-leading energy efficiency with exceptional performance, the F97x family is the most advanced capacitive sensing 8-bit MCU solution available, backed by our industry-leading Simplicity Studio ecosystem.”

Pricing and Availability

Samples and production quantities of the C8051F97x MCUs are available now. Product pricing in 10,000-unit quantities begins at $1.18 (USD). To help developers accelerate their human interface designs, Silicon Labs offers the C8051F970-A-DK development kit priced at $99 (USD MSRP). For additional F97x MCU product information and samples and to download the Simplicity Studio development platform at no charge, please visit www.silabs.com/8bit-mcu.

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.

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