

Silicon Labs Launches Industry's Most Energy-Friendly, Easiest-to-Use Humidity Sensors

High-Precision Si701x/2x "Sensor on a Chip" Family Simplifies Relative Humidity Sensing For Consumer, Industrial and Automotive Designs

"As the only single-chip RH/temperature sensing solutions offered by a broad-based semiconductor supplier, the Si701x/2x sensors can be combined with Silicon Labs' energy-friendly MCUs, ZigBee and sub-GHz wireless ICs, and other sensor products to address wireless sensing applications for the Internet of Things."

AUSTIN, Texas--([BUSINESS WIRE](#))--[Silicon Labs](#) (NASDAQ: SLAB), a leader in high-performance, analog-intensive, mixed-signal ICs, today introduced a new family of relative humidity (RH) and temperature sensors that simplify RH sensing designs while providing industry-leading power efficiency and ease of use. Silicon Labs' second-generation RH sensing solution, the Si701x/2x sensors combine a standard CMOS mixed-signal IC with a proven technique of measuring humidity using a polymer dielectric film. The new family enables accurate RH sensing for home automation, HVAC, refrigeration, healthcare, remote monitoring, automotive and industrial equipment. When combined with Silicon Labs' broad portfolio of energy-friendly microcontrollers and wireless ICs, the Si701x/2x family enables best-in-class solutions for measuring, controlling and reporting environmental conditions for a wide range of connected devices linked to the Internet of Things.

The Si701x/2x sensor family provides a superior alternative to legacy RH sensing approaches, which use discrete resistive or capacitive RH sensing elements along with analog circuits for temperature compensation and signal conditioning. These discrete solutions typically require a large bill of materials (BOM) and PCB area and suffer from lower reliability and risk of contamination. Customers also must perform RH/temperature calibration during PCB assembly, and discrete solutions are not compatible with surface-mount technology (SMT) manufacturing. RH sensor module suppliers have attempted to solve these manufacturing challenges, but they do so at a higher system cost and without improving reliability or risk of contamination.

In contrast to discrete approaches, the Si701x/2x monolithic ICs offer the highest ease of use while reducing manufacturing cost and complexity. The Si701x/2x family requires negligible BOM cost and is fully calibrated and SMT compatible. The integrated CMOS design provides the highest long-term reliability, and an optional filter cover provides added protection against contamination. The factory-installed cover – a Teflon membrane sealed at the top of the IC – protects the sensor not only during PCB assembly but also throughout the device's entire lifetime, shielding the sensing element from dust, dirt and cleaning agents during operation.

The Si701x/2x sensors have the lowest power consumption in the integrated RH/temperature sensor market. With a 3.3 V power supply voltage and 8-bit resolution, the Si701x/2x sensors consume only 1.9 μ W average on-chip power when taking one sample per second, which is up to six times lower power than competing RH sensors. This energy efficiency makes the Si701x/2x family an excellent choice for power-sensitive applications and helps extend battery life.

Offering RH sensing precision that is among the best in the industry, the Si701x/2x family is suitable for a majority of RH and temperature sensing applications that have stringent accuracy requirements. The Si701x/2x sensors maintain $\pm 3\%$ RH maximum accuracy over a wider range of humidity (from 0 to 80% RH) than competing RH/temperature sensors. The sensors also maintain ± 0.4 °C maximum temperature accuracy over a wider temperature range (from -10 to +85 °C) than competing devices. In addition, the Si701x/2x family has the lowest long-term RH drift at $<0.25\%$ RH per year, ensuring superior long-term RH accuracy.

The Si701x/2x family features the industry's only integrated RH/temperature sensor product that supports a two-zone temperature measurement capability. The new Si7013 device supports second-zone temperature sensing with programmable linearization, which eliminates the need for an additional analog-to-digital converter (ADC) and compensation software in the system. Applications such as thermostats that require a second-zone temperature sensor can now use the Si7013 to efficiently measure the analog voltage of an external thermistor.

"The new Si701x/2x family represents the state of the art in RH sensing, offering an unmatched combination of ultra-low power, ease of use, small size, precision, reliability and compatibility with standard manufacturing flows," said Mark Thompson, vice president and general manager of Silicon Labs' Access, Power and Sensor products. "As the only single-chip RH/temperature sensing solutions offered by a broad-based semiconductor supplier, the Si701x/2x sensors can be combined with Silicon Labs' energy-friendly MCUs, ZigBee and sub-GHz wireless ICs, and other sensor products to address wireless sensing applications for the Internet of Things."

Pricing and Availability

Production quantities of Silicon Labs' Si701x/2x humidity and temperature sensors are available now in a small-footprint 3 mm x 3 mm QFN package that is pin-compatible with other digital RH sensors available in the market. Product pricing for the Si701x/2x RH sensors in 10,000-unit quantities begins at \$2.13 (USD).

The Si701x/2x family is supported by hardware and software tools that ease testing, characterization, prototyping and software development. (All kit prices are in USD MSRP.)

- The USB-based Si7013USB-DONGLE evaluation kit, priced at \$49, provides everything developers need to demonstrate and evaluate the Si701x/2x family.
- The Si7013EVB-UDP daughter card, priced at \$49, allows easy sensor evaluation in concert with Silicon Labs' C8051F960-A-DK MCU development kit. The daughter card plugs directly into the MCU card for fast prototyping and software development.
- The Si7013EVB-UDP-F960 development kit, priced at \$149, combines a C8051F960 MCU development kit with a daughter card into a portable demonstration platform (no PC required) that includes data logger demonstration code.

For additional Si701x/2x sensor family information and to order samples and development tools, please visit www.silabs.com/humidity-sensor.

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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