

Silicon Labs Obsoletes Optocouplers with Drop-in Digital Isolators

CMOS-Based Si87xx Isolators Offer Longer Device Lifetime and Superior Reliability, Enabling Manufacturers to Extend Product Warranties

“ Our new opto-replacement solution is the best choice for systems that currently use outmoded optocouplers but need significant improvements in power efficiency, performance, reliability and product lifetime. ”

AUSTIN, Texas--([BUSINESS WIRE](#))--[Silicon Laboratories Inc.](#) (NASDAQ: SLAB), a leader in high-performance, analog-intensive, mixed-signal ICs, today introduced the industry's first drop-in replacement for optocouplers based on mainstream CMOS technology and incorporating an innovative light-emitting diode (LED) emulator input. The new Si87xx digital isolators offer a perfect pin configuration, package and footprint fit for a number of optocoupler products while offering superior noise immunity, more robust performance and greater reliability, making them ideal for solar power inverters, switched mode power supplies (SMPS), uninterruptible power supplies (UPS), industrial drives, programmable logic controllers (PLCs), high-voltage medical equipment and other applications that often use optocouplers.

Used for more than 40 years, optocouplers are inherently limited by outdated LED-based technology, which exhibits significant output variation over input current, temperature and age. These variations reduce the operating performance and reliability over the optocoupler's lifetime, resulting in increased design complexity and shorter life expectancy for end products. Because of their aging effects, optocouplers are often specified to last only 10 years, posing a serious problem for industrial system designers who want to develop products with 20+ year warranties.

Silicon Labs' Si87xx opto-replacement devices use a patented CMOS-based isolation architecture that is completely immune to the output variations that plague LED-based optocouplers. CMOS-based capacitive isolation technology provides more than ten times the mean-time-to-failure (MTTF) rate of optocouplers. By offering longer device lifetimes and higher reliability, the Si87xx isolators enable system manufacturers to support longer end product warranties and reduce costs associated with repair or replacement. Less variability, especially in the input turn-on current, also simplifies system designs since engineers no longer need to anticipate aging effects when using the Si87xx devices.

The Si87xx family is based on Silicon Labs' industry-leading capacitive isolation technology, with isolation ratings up to 5 kV and fully compliant with IEC 60747-5-2 including 10 kV surge protection. The family meets the requirements for IEC 60950-1, 61010-1 and 60601-1 (reinforced insulation) and provides up to 1200 V working voltage with a 60+ year lifetime.

In addition to their inherent immunity to temperature, age and forward current effects, the Si87xx isolators offer other significant performance advantages over competing optocouplers:

- The Si87xx devices offer a 50 percent lower input turn-on current and a 10x lower output quiescent current than competing optocouplers, reducing overall system power.
- The low parasitic capacitance of the Si87xx digital isolation architecture improves the common mode transient immunity (CMTI) by as much as 75 percent over competing optocouplers, thereby enhancing system data integrity. Due to the inherent high parasitic capacitance of their LED-based architecture, optocouplers suffer from poor CMTI, which can lead to incorrect data being passed across the isolator.
- The Si87xx isolators outperform optocouplers in key timing specifications, such as propagation delay and pulse-width distortion, enabling faster, more accurate data transfer and improved efficiency.

“The new Si87xx family represents the industry's first major step along the path to drop-in optocoupler replacement by providing a perfect package/footprint fit for a number of widely used optocoupler products,” said Mark Thompson, vice president and general manager of Access, Power and Sensor products at Silicon Labs. “Our new opto-replacement solution is the best choice for systems that currently use outmoded optocouplers but need significant improvements in power efficiency, performance, reliability and product lifetime.”

All Si87xx isolators incorporate an innovative LED emulator input that, along with new package options, allows Silicon Labs to offer a fully drop-in compatible upgrade for many existing optocouplers. The base Si8710 device consists of an LED emulator input and an open-collector output. Two additional device configurations are available: the Si8711 adds an integrated pull-up resistor, and the Si8712 includes a dedicated enable pin that

can asynchronously control the output.

Pricing and Availability

Samples and production quantities of the Si87xx digital isolators are available now in SOIC-8 and GW DIP-8 packages with isolation ratings up to 3.75 kV. Si87xx products in SO-6 and LGA-8 packages certified to 5 kV isolation ratings will be available in Q1 2013. Pricing for the new Si87xx digital isolators in 10,000-unit quantities begins at \$0.43 (USD).

The Si87xxDIP8-KIT Evaluation Kit, available now for \$29 (USD MSRP), enables customers to evaluate the performance of Si87xx opto-replacement isolators. The evaluation board is flexible enough to allow both hook-up to lab equipment for detailed specification evaluation as well as connection to the customer's existing board.

For additional information about Silicon Labs' Si87xx digital isolators and to purchase samples and development tools, please visit www.silabs.com/pr/isolation.

Silicon Laboratories Inc.

Silicon Laboratories 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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