Silicon Labs Launches Industry's First Custom Solid-State Relay Solution Based on CMOS Isolation Technology

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Si875x Isolated FET Driver Family Reduces Cost and Complexity of Industrial and Automotive Relay Replacement Applications

AUSTIN, Texas--(BUSINESS WIRE)-- Silicon Labs (NASDAQ: SLAB) has introduced a groundbreaking CMOS-based isolated field effect transistor (FET) driver family that enables developers to use their choice of application-specific, high-volume FETs to replace outmoded electromechanical relays (EMRs) and optocoupler-based solid-state relays (SSRs). The new Si875x family features the industry's first isolated FET drivers designed to transfer power across an integrated CMOS isolation barrier, eliminating the need for isolated secondary switch-side power supplies and reducing system cost and complexity. When paired with a discrete FET, the Si875x drivers provide a best-in-class EMR/SSR replacement solution for motor and valve controllers, HVAC relays, battery monitoring, AC mains line and communications switches, HEV/EV automotive charging systems, and other industrial and automotive applications.

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Silicon Labs' Si875x isolated FET drivers provide best-in-class solution for industrial and automotive relays (Graphic: Business Wire)

Get all the details about Silicon Labs' Si875x isolated FET drivers including product pricing and availability, development tools and data sheets at www.silabs.com/Si875x.

Developers have traditionally used EMRs and optocoupler-based SSRs in switching applications, and both technologies have limitations. EMRs are costly, slow, bulky and noisy. These drawbacks are driving double-digit growth in SSR usage, but even SSRs pose challenges. Optocoupler-based SSRs have inherent limitations such as shorter lifetimes due to LED aging, reduced performance and stability at higher temperatures, and reduced noise immunity. They also use a limited choice of integrated FETs, further compromising performance, cost and power.

Silicon Labs' CMOS-based Si875x isolated FET drivers offer a better alternative that reduces system cost and power and enhances performance for applications served by SSRs or EMRs. Since Si875x drivers do not use LEDs or optical components, they provide superior stability over time and temperature. The small-footprint Si875x devices offer completely silent switching, making them an ideal replacement solution for bulky EMRs that are limited by electrical switching noise and wear-out problems, as well as mass production challenges.

The Si875x devices drive FET gates with a nominal 10.3 V using a very low 1 mA input with 1.1 ms turn-on time. Increasing the input current to 10 mA enables an exceptionally fast turn-on time of 94 µs. A unique power optimization option delivers maximum turn-on current for fast speed and then lowers it by up to 90 percent for static holding current once the optional external cap is discharged. Flexible 2.25 V to 5.5 V input side voltages support seamless connection to low-power controllers. The Si875x drivers also feature an optional Miller clamp capability to prevent unintended turn on of the external FET.

The Si875x devices have a 2.5 kVrms isolation rating, can operate over full industrial and automotive temperature ranges (up to +125^{o}C), and are designed to meet stringent UL, CSA, VDE and CQC standards. Versatile inputs provide digital CMOS pin control (Si8751 devices) or diode emulation (Si8752 devices) to best suit the target application, and flexible outputs support ac and dc load configurations.

"With their unique combination of robust, reliable CMOS-based isolation technology and revolutionary capability to transfer power across the isolation barrier, Silicon Labs' Si875x drivers provide a much-needed replacement solution for antiquated EMRs and optocoupler-based SSRs," said Ross Sabolcik, Vice President of power products at Silicon Labs. "The new Si875x family gives developers the flexibility to choose a cost-effective FET customized to their application needs, creating an easy migration to state-of-the-art solid-state switching."

Si875x Isolated FET Driver Family Highlights

- Industry's first CMOS isolation-based SSR solution, supporting application-specific FETs
- Best-in-class noise immunity, high reliability and 2.5 kVrms isolation rating
- Long lifetimes under high-voltage conditions (100 years at 1000 V)
- Efficient switching: 10.3 V at the gate with only 1 mA of input current
- Wide input voltage of 2.25 V to 5.5 V enables power savings
- Unique pin feature optimizes power consumption/switching time trade-off
- Miller clamping prevents unintended turn on of external FET
- Small SOIC-8 package integrates isolation and power capacitors for low-power applications
- AEC-Q100-qualified automotive-grade device options

Pricing and Availability

Samples of the Si875x isolated FET drivers are available now with production quantities planned for November 2016. The Si875x devices come in a small SOIC-8 package with industrial (-40˚C to +105˚C) or automotive (-40˚C to +125˚C) ambient temperature operating range options. Pricing in 10,000-unit quantities begins at $0.96 (USD) for industrial versions and $1.20 (USD) for automotive temperature options. The Si8751-KIT (digital input) and Si8752-KIT (LED emulator input) evaluation kits are available now and priced at $39.99 each (USD MSRP). To purchase Si875x product

samples and development kits, please visit www.silabs.com/Si875x.

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

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