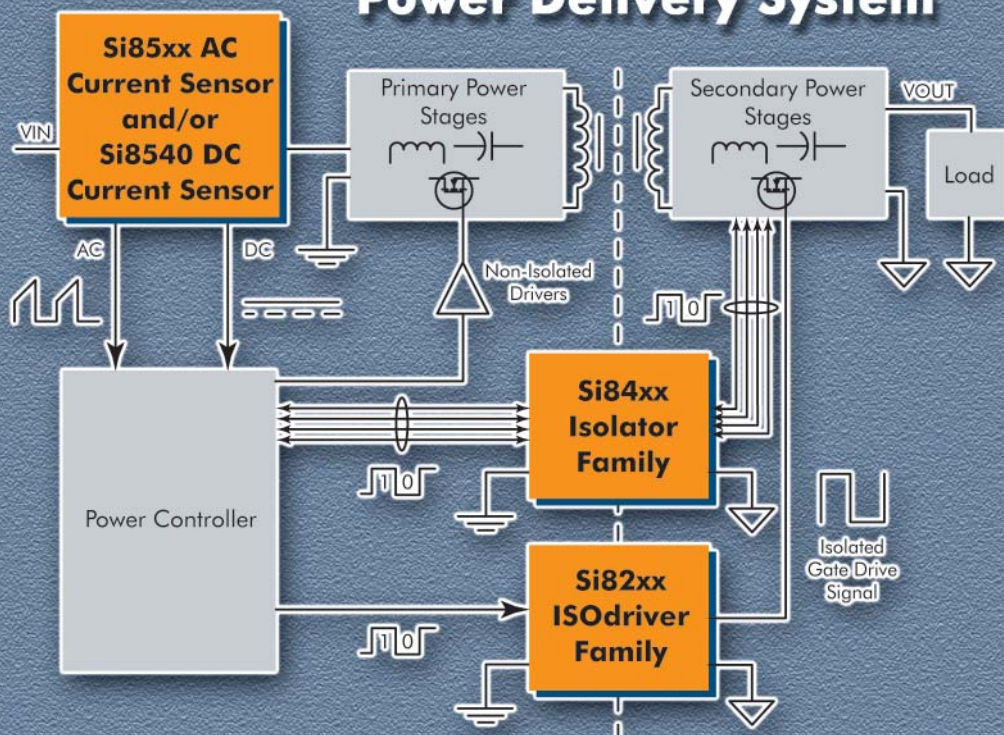


Isolation and Power Solutions

HIGH-PERFORMANCE, SMALL SIZE

Power Delivery System



DIGITAL ISOLATORS

The Si84xx family of digital isolators is the industry's highest performance, easiest-to-use, lowest cost 2.5 kV_{RMS} digital isolator product family. These highly integrated one- to four-channel isolators that are one-third the size of competing opto-coupler solutions, and reduce bill-of-material cost by as much as 50%. They are available in 8-pin or 16-pin wide body SOIC packages with three speed grade options: 1, 10, or 150 Mbps.

ISOdrivers (ISOLATED GATE DRIVERS)

Utilizing Silicon Labs' proprietary silicon isolation technology, the Si823x isolated drivers are high-performance upgrades for opto-coupled drivers or gate drive transformers. These products offer higher drive capability, fast propagation times and a full feature set including overlap protection, programmable dead time and undervoltage lock out (UVLO). Additionally, ISOdrivers require the fewest number of external components compared to existing solutions.

ISOLATED AC CURRENT SENSORS

The Si850x/1x products are unidirectional ac current sensors available in full scale ranges of 5, 10 and 20 A. These products offer size and performance advantages over current transformers, Hall effect devices, DCR circuits and other approaches. The Si850x/1x are extremely low loss, adding less than 1.3 mΩ of series resistance and less than 2 nH of series inductance in the sensing path at 25 °C. Current-sensing terminals are isolated from the other package pins to a maximum voltage of 1KV_{DC}.

HIGH SIDE DC CURRENT SENSOR

The Si8540 is a uni-directional, high-side current sense amplifier for use in applications that require current monitoring and control. This cost-effective, high-side current sense amplifier operates with common mode voltages to 36 V (max). It operates over a frequency range of DC-20 KHz, and can be configured to measure full-scale currents from 100 mA to 10 A.

FEATURES

Digital Isolators

- 2.5 kV_{RMS} isolation
- High-speed operation: DC to 150 Mbps
- Low propagation delay: <10 ns
- Wide operating supply voltage: 2.375–5.5 V
- Low power: < 12 mA/channel at 100 Mbps
- Resistant to temperature and aging effects

ISOdrivers (Isolated Gate Drivers)

- 2.5 kV_{RMS} output-to-input isolation
- 600 V_{DC} output-to-output isolation
- 0.5, 4.0 A peak output current
- 50 ns propagation delay
- Wide gate driver supply voltage: 8 to 24 V
- Undervoltage lockout protection with hysteresis
- Resistant to temperature and aging effects

Isolated AC Current Sensors

- 5, 10 and 20 A full-scale versions, 2 V_{pp} output swing
- ±5% measurement accuracy
- Low loss: < 1.3 mΩ series resistance
- Leading-edge noise suppression
- "Ping-Pong" output mode allows one Si851x to replace two current transformers in full-bridges
- High-side or low-side current sensing

High-Side DC Current Sensor

- Internal temperature sensor
- Output option for temperature measurement
- 0.2% full scale accuracy
- +5 to +36 V supply operation
- 90 μA max supply current; 9 μA shutdown current
- Operating temperature range -40 to +85 °C

APPLICATIONS

- AC-DC, DC-DC converters and UPS systems
- Motor control
- Isolated A/D and D/A conversion
- Test and measurement
- Industrial communications
- Plasma displays
- Automotive system
- Audio and video equipment

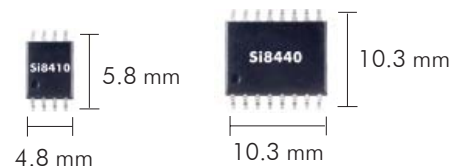
SOLUTIONS GUIDE

HIGHLY-INTEGRATED, EASY-TO-USE
ISOLATION AND POWER SOLUTIONS



Digital Isolators

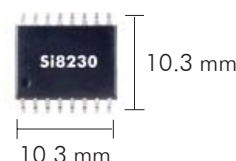
- Small footprint: 1/3 the size of opto-coupler solutions
- Fastest throughput: 150 Mbps max
- Lowest power consumption: 12 mA per channel at 100 Mbps



Part Number	Channels	Max Data Rate	Temperature	Package
Si8410	1 Forward Channel	1, 10, 150 Mbps	-40 to 125 °C	Wide Body SOIC8
Si8420	2 Forward Channels	1, 10, 150 Mbps	-40 to 125 °C	Wide Body SOIC8
Si8421	1 Forward and 1 Reverse Channel	1, 10, 150 Mbps	-40 to 125 °C	Wide Body SOIC8
Si8430	3 Forward Channels	1, 10, 150 Mbps	-40 to 125 °C	Wide Body SOIC16
Si8431	2 Forward and 1 Reverse Channel	1, 10, 150 Mbps	-40 to 125 °C	Wide Body SOIC16
Si8435	3 Forward Channels	1, 10, 150 Mbps	-40 to 125 °C	Wide Body SOIC16
Si8440	4 Forward Channel	1, 10, 150 Mbps	-40 to 125 °C	Wide Body SOIC16
Si8441	3 Forward and 1 Reverse Channel	1, 10, 150 Mbps	-40 to 125 °C	Wide Body SOIC16
Si8442	2 Forward and 2 Reverse Channels	1, 10, 150 Mbps	-40 to 125 °C	Wide Body SOIC16
Si8445	4 Forward Channels	1, 10, 150 Mbps	-40 to 125 °C	Wide Body SOIC16

ISODrivers (Isolated Gate Drivers)

- Smallest footprint: isolator and driver integrated into single IC
- Fastest propagation times enable better efficiency
- Undervoltage lockout (UVLO) prevents startup/shutdown problems
- Integrated overlap protection
- Programmable dead time



Part Number	Configuration	Overlap Protection	Programmable Dead Time	Inputs	Pk IOUT (A)	Package
Si8230	High-Side/Low-Side	Yes	Yes	VIA, VIB	0.5	Wide Body SOIC16
Si8231	High-Side/Low-Side	Yes	Yes	PWM	0.5	Wide Body SOIC16
Si8232	Dual Low-Side	—	—	VIA, VIB	0.5	Wide Body SOIC16
Si8233	High-Side/Low-Side	Yes	Yes	VIA, VIB	4.0	Wide Body SOIC16
Si8234	High-Side/Low-Side	Yes	Yes	PWM	4.0	Wide Body SOIC16
Si8435	Dual Low-Side	—	—	VIA, VIB	4.0	Wide Body SOIC16

Current Sensors

- Industry's smallest size enables 75% board space reduction
- Low loss: less than 1.3 mΩ series resistance (Si850x, Si851x)
- Lowest bill-of-materials (BOM) cost (1 capacitor) (Si850x, Si851x)



Part Number	Type	Full Scale Current (A)	Full Scale Error (% of Reading)	Output Mode	Package
Si8501	AC	5	±5	Single	12-Pin QFN
Si8502	AC	10	±5	Single	12-Pin QFN
Si8503	AC	20	±5	Single	12-Pin QFN
Si8504	AC	5	±20	Single	12-Pin QFN
Si8505	AC	10	±20	Single	12-Pin QFN
Si8506	AC	20	±20	Single	12-Pin QFN
Si8511	AC	5	±5	Ping-Pong	12-Pin QFN
Si8512	AC	10	±5	Ping-Pong	12-Pin QFN
Si8513	AC	20	±5	Ping-Pong	12-Pin QFN
Si8514	AC	5	±20	Ping-Pong	12-Pin QFN
Si8515	AC	10	±20	Ping-Pong	12-Pin QFN
Si8516	AC	20	±20	Ping-Pong with FAULT output	12-Pin QFN
Si8517	AC	5	±5	Ping-Pong with FAULT output	12-Pin QFN
Si8518	AC	10	±5	Ping-Pong with FAULT output	12-Pin QFN
Si8519	AC	20	±5	Ping-Pong with FAULT output	12-Pin QFN
Si8540	DC	Configurable	±0.2	Configurable	5 or 8-pin SOIC

Note: All power solutions packages are Pb-free and RoHS compliant.