The Skyworks’ digital isolation product portfolio leverages our superior isolation and high-voltage expertise to enhance system performance, flexibility, and reliability while reducing system size and cost. Our family of products includes CMOS digital isolators, isolated gate drivers, isolated analog amplifiers, industrial I/Os and isolated ADCs. Our family of isolators supports voltages up to 5 kV.

Isolation Product Families

- **Digital Isolator**
  - **IN**: Digital control or data signal
  - **OUT**: Reproduced digital control or data signal

- **Isolated Gate Driver**
  - **IN**: 3V-5V pulse width modulated digital signal
  - **OUT**: 15-30V digital signal

- **Isolated Analog**
  - **IN**: Analog signal
  - **OUT**: Digital representation of analog signal

- **Industrial I/O**
  - **IN/OUT**: High voltage digital signal
  - **OUT/IN**: Low voltage digital signal
Isolation Applications

Industrial
- Motor control
- Factory automation
- Programmable logic controllers (PLCs)

Automotive
- Battery management
- Isolated fieldbus
- Inverters and chargers

Solar Inverters
- Isolated communication
- DC-AC inverters
- DC-DC converter

Power Supplies
- UPS
- Server supplies
- Communications supplies

Consumer
- Inductive cooktops
- Motor control
- Lighting

Telecom
- Isolated communication
- VoIP gateways
- Service ports
Each of our digital isolator product families is designed and continuously adapted to serve specific industry applications. Each ship with Skyworks’ proprietary CMOS capacitive isolation technology. Customers can trust in low electro-magnetic emissions, high immunity to external fields, and robust, industrial-grade performance with high noise immunity, with a temperature operating range of up to 125 °C.

Features

Si86xx/Si86xxT

- Exceptional isolator timing characteristics with a typical latency of under 10 ns
- 10 Mbps-capable, 16 channels of signal isolation in compact QOP packages or wide creepage SOIC, 8 mm

Si87xx

- Unique pin-to-pin compatibility for drop-in upgrades to popular optocouplers

Si88xx

- Integrated DC-DC converter with feedback-controlled regulation

Industrial Automation Application Example

Digital Isolators

<table>
<thead>
<tr>
<th>Family</th>
<th>Unidirectional Channels</th>
<th>Bidirectional Channels</th>
<th>Isolation Rating</th>
<th>Input Type</th>
<th>Package Type</th>
<th>Max Data Rate</th>
<th>Max Propagation Delay</th>
<th>Input Supply</th>
<th>Output Supply</th>
<th>Forward Channels</th>
<th>Reverse Channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Si80xx</td>
<td>3, 4, 5, 6</td>
<td>0</td>
<td>1 kV&lt;sub&gt;rms&lt;/sub&gt;</td>
<td>Digital</td>
<td>QSOP-16</td>
<td>—</td>
<td>65 ms</td>
<td>3.15-5.5 V</td>
<td>3.15-5.5 V</td>
<td>3, 4, 5, 6</td>
<td>0</td>
</tr>
<tr>
<td>Si86xx</td>
<td>0, 1, 2, 3, 4, 5, 6</td>
<td>0, 1, 2</td>
<td>1-5 kV&lt;sub&gt;rms&lt;/sub&gt;</td>
<td>Digital</td>
<td>NB SOIC-16, NB SOIC-8, QSOP-16, WB SOIC-16</td>
<td>1.7, 150 Mbps</td>
<td>13-55 ms</td>
<td>2.5-5.5 V</td>
<td>2.5-5.5 V</td>
<td>0, 1, 2, 3, 4, 5, 6</td>
<td>0, 1, 2, 3</td>
</tr>
<tr>
<td>Si86xxT</td>
<td>2, 3, 4</td>
<td>0</td>
<td>5 kV&lt;sub&gt;rms&lt;/sub&gt;</td>
<td>Digital</td>
<td>WB SOIC-16</td>
<td>150 Mbps</td>
<td>13 ms</td>
<td>2.5-5.5 V</td>
<td>2.5-5.5 V</td>
<td>1, 2, 3, 4</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>Si87xx</td>
<td>1</td>
<td>0</td>
<td>3.75-5 kV&lt;sub&gt;rms&lt;/sub&gt;</td>
<td>LED Emulator</td>
<td>GW DIP8, NB SOIC-8, WB SOIC-6</td>
<td>1, 15 Mbps</td>
<td>50-60 ms</td>
<td>—</td>
<td>2.25-30 V</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Si88xx</td>
<td>2, 4</td>
<td>0</td>
<td>3.75-5 kV&lt;sub&gt;rms&lt;/sub&gt;</td>
<td>Digital</td>
<td>WB SOIC-16, WB SOIC-20, WB SOIC-24</td>
<td>100 Mbps</td>
<td>23 ms</td>
<td>3-5.5 V</td>
<td>3-5.5 V</td>
<td>0, 1, 2, 3, 4</td>
<td>0, 1, 2, 3, 4</td>
</tr>
</tbody>
</table>

Learn More

Documents

4 | www.skyworksinc.com/ia/isolation
Isolated Gate Drivers

With utilitarian and highly integrated safety features, Skyworks defined the industry standard for isolated gate drivers—high-side, low-side, and dual. In addition to each of the benefits of our proprietary CMOS capacitive isolation technology, which include signature low electro-magnetic emissions, high immunity to external fields, and robust industrial grade performance, Skyworks’ gate drivers also include several safety-integrated features: dead-time programmability, overlap protection, power status pin positioned on the isolated side, and asynchronous shutdown protection.

Features

Si823x/Si8239x
- Industry-defining high-side/low-side, or dual drivers in compact LGA/QFN packages or wide creepage SOIC, -8 mm
- Driver-side power status pin on isolated logic side

Si827x
- High gate driver noise immunity for driving fast-switching GaN/ SiC FETs, -300 kV/ us
- Low UVLO options for driving GaN/ SiC FETs

Si826x
- Unique pin-to-pin compatibility for drop-in upgrades to popular opto drivers
- Available in wide-SOIC and compact, 6-pin packages for 5 kVrms applications

Si828x
- IGBT drivers with built-in desaturation and auto soft shutdown
- Integrated DC-DC converter with feedback control for tight load and line regulation

Isolated Gate Drivers

<table>
<thead>
<tr>
<th>Family</th>
<th>Isolation Rating</th>
<th>Package Type</th>
<th>Input Type</th>
<th>Input Voltage Range</th>
<th>Output Configuration</th>
<th>Output Voltage Range</th>
<th>Peak Output Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Si828x</td>
<td>3.75-5 kV&lt;sub&gt;rms&lt;/sub&gt;</td>
<td>WB SOIC-16, WB SOIC-20, WB SOIC-24</td>
<td>Complementary Digital</td>
<td>3 - 5.5 V</td>
<td>Separate Pull-Up/Pull-Down, Single Output</td>
<td>10 - 30 V</td>
<td>4 A</td>
</tr>
<tr>
<td>Si827x</td>
<td>1 - 2.5 kV&lt;sub&gt;rms&lt;/sub&gt;</td>
<td>DFN-14, NB SOIC-16, NB SOIC-8</td>
<td>PWM, Single, Dual</td>
<td>3 - 5.5 V</td>
<td>Dual Driver, High-Side / Low-Side, Separate Pull-Up/Pull-Down</td>
<td>4 - 30 V</td>
<td>4 A</td>
</tr>
<tr>
<td>Si822x/3x</td>
<td>1-5 kV&lt;sub&gt;rms&lt;/sub&gt;</td>
<td>LGA-14, NB SOIC-16, DFN-14, WB SOIC-14, WB SOIC-16</td>
<td>LED emulator, PWM, Dual</td>
<td>None, 3 - 5.5 V</td>
<td>Dual Driver, High-Side / Low-Side</td>
<td>6 - 24 V</td>
<td>0.5 - 4 A</td>
</tr>
<tr>
<td>Si823Hx</td>
<td>2.5 - 5 kV&lt;sub&gt;rms&lt;/sub&gt;</td>
<td>DFN-14, NB SOIC-8, WB SOIC-16, WB SOIC-14</td>
<td>PWM, Single, Dual</td>
<td>3 - 5.5 V</td>
<td>Dual Driver, High-Side / Low-Side, Separate Pull-Up/Pull-Down</td>
<td>6 - 30 V</td>
<td>4 A</td>
</tr>
<tr>
<td>Si825x</td>
<td>5 kV&lt;sub&gt;rms&lt;/sub&gt;</td>
<td>WB SOIC-14</td>
<td>Dual</td>
<td>4.5 - 20 V</td>
<td>High-Side / Low-Side</td>
<td>5 - 30 V</td>
<td>4 A</td>
</tr>
<tr>
<td>Si826x</td>
<td>3.75-5 kV&lt;sub&gt;rms&lt;/sub&gt;</td>
<td>GW DIP8, NB SOIC-8, WB SO6</td>
<td>LED emulator</td>
<td>None</td>
<td>Separate Pull-Up/Pull-Down, Single Output</td>
<td>5 - 30 V</td>
<td>0.6 - 4 A</td>
</tr>
</tbody>
</table>

Learn More **Documents**
Skyworks Si890x/Si892x isolated analog and isolated ADCs are ideal for a broad range of applications, including AC-DC switching power supplies, isolated DC-DC supplies, UPS systems and inverters for motor control. The Si890x enables isolated AC mains monitoring while the Si892x provides shunt resistor-based current sensing solutions for a wide range of power applications.

### Features

**Si890x**
- 10-bit ADC with 3-channel muxed analog input and I2C, SPI or UART digital output formats
- Ideal for line monitoring

**Si8920**
- Up to 5 kV_{RMS} 1-channel isolated analog amplifier with 400 kHz bandwidth and group delay of 70 ns
- Ideal for current measurements

### Motor Control Application Example

![Motor Control Application Example Diagram](diagram.png)

### Si892x Isolated Amplifiers

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package Type</th>
<th>Input Range</th>
<th>Output Gain</th>
<th>Output Range</th>
<th>Initial Accuracy</th>
<th>Isolation Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Si8920Ax</td>
<td>GW DIP8, WB SOIC-16</td>
<td>±100 mV</td>
<td>16x</td>
<td>±1.6 V</td>
<td>1.50%</td>
<td>3.75 - 5 kV_{RMS}</td>
</tr>
<tr>
<td>Si8920Bx</td>
<td>GW DIP8, WB SOIC-16</td>
<td>±200 mV</td>
<td>8x</td>
<td>±1.6 V</td>
<td>0.75%</td>
<td>3.75 - 5 kV_{RMS}</td>
</tr>
</tbody>
</table>

### Si890x Isolated ADCs

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package Type</th>
<th>Output Mode</th>
<th>Full Scale Current</th>
<th>Initial Accuracy</th>
<th>Isolation Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Si8900x</td>
<td>WB SOIC-16</td>
<td>UART</td>
<td>10 A</td>
<td>0.10%</td>
<td>2.5 - 5 kV_{RMS}</td>
</tr>
<tr>
<td>Si8901x</td>
<td>WB SOIC-16</td>
<td>I2C/SMBus</td>
<td>10 A</td>
<td>0.10%</td>
<td>2.5 - 5 kV_{RMS}</td>
</tr>
<tr>
<td>Si8902x</td>
<td>WB SOIC-16</td>
<td>SPI</td>
<td>10 A</td>
<td>0.10%</td>
<td>2.5 - 5 kV_{RMS}</td>
</tr>
</tbody>
</table>
Skyworks offers a complete set of I/O solutions for the industrial automation market. The Si838x isolated bipolar digital input offers eight sourcing or sinking channels in a compact package. This is ideally suited for a wide range of industrial voltage levels including the IEC 61131-2 standard of 24 V. The Si834x Isolated Smart Switch combines four low RON high-side or low-side switches with robust diagnostics and channel protection. The Si875x Isolated FET driver offers a simple method for customers to replace solid-state relays (SSRs) or electromechanical relays (EMRs) with a compact device requiring only one power supply. Flexible outputs support driving AC or DC load configurations. All industrial I/O products include Skyworks cutting-edge safety-rated isolation qualifications certified by UL, CSA, VDE and CQC.

Features

Si838x
- Unique 8-channel, bipolar LED input isolator ideal for programmable logic controllers
- SPI interface enables daisy chaining up to 128 channels with just four MCU pins

Si834x
- Built-in over-current and inductive kick protection
- Up to eight different channel and device diagnostics

Si875x
- Self-powered output to drive external FET
- LED emulator or digital pin input options

Si838x Isolated PLC Input

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Channels</th>
<th>Output Interface</th>
<th>Low Pass Filter Delay</th>
<th>Package Type</th>
<th>Isolation Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Si8380Sx</td>
<td>8</td>
<td>SPI</td>
<td>0 - 100 ms</td>
<td>20-OSOP</td>
<td>2.5 kV&lt;sub&gt;PESS&lt;/sub&gt;</td>
</tr>
<tr>
<td>Si838xPx</td>
<td>8</td>
<td>Parallel</td>
<td>0 - 100 ms</td>
<td>20-OSOP</td>
<td>2.5 kV&lt;sub&gt;PESS&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

Si834x Isolated Smart Switch

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Output Switch</th>
<th>Input Interface</th>
<th>Channels</th>
<th>Output Current</th>
<th>Channel Indicators</th>
<th>Package</th>
<th>Isolation Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Si834x4xAAx</td>
<td>Sourcing, Sinking</td>
<td>Parallel</td>
<td>4</td>
<td>0.7 A</td>
<td>Yes</td>
<td>9x9 DFN-32</td>
<td>1.5 kV&lt;sub&gt;PESS&lt;/sub&gt;</td>
</tr>
<tr>
<td>Si834x8xDAx</td>
<td>Sourcing, Sinking</td>
<td>SPI</td>
<td>4</td>
<td>0.7 A</td>
<td>Yes</td>
<td>9x9 DFN-32</td>
<td>1.5 kV&lt;sub&gt;PESS&lt;/sub&gt;</td>
</tr>
<tr>
<td>Si834x8xFAx</td>
<td>Sourcing, Sinking</td>
<td>Parallel/SPI</td>
<td>4</td>
<td>0.7 A</td>
<td>No</td>
<td>9x9 DFN-32</td>
<td>1.5 kV&lt;sub&gt;PESS&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

Si875x Isolated FET Driver

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Input Type</th>
<th>Driver ON Resistance</th>
<th>Max Propagation Delay</th>
<th>Driver Supply Range</th>
<th>Package Type</th>
<th>Isolation Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Si8751AB-IS</td>
<td>Digital CMOS</td>
<td>Adjustable (1500 - 162 kΩ)</td>
<td>41 µs</td>
<td>8 - 13 V</td>
<td>NB SOIC-8</td>
<td>2.5 kV&lt;sub&gt;PESS&lt;/sub&gt;</td>
</tr>
<tr>
<td>Si8752AB-IS</td>
<td>Diode Emulation</td>
<td>Adjustable (2700 - 168 kΩ)</td>
<td>41 µs</td>
<td>8 - 13 V</td>
<td>NB SOIC-8</td>
<td>2.5 kV&lt;sub&gt;PESS&lt;/sub&gt;</td>
</tr>
</tbody>
</table>
Environmental and Safety Compliance

Isolation Products Meet Safety Standard Compliance

Skyworks isolation products adhere to global requirements and standards for safety compliance and mechanical creepage and clearance. Digital isolator, AC current sensor and ISO driver products support up to 8 mm of creepage and clearance using a widebody SOIC package to meet the industry’s most stringent requirements. The devices also adhere to worldwide safety standards through Underwriter Laboratories (UL), CSA, CQC and VDE certification with devices specifying up to 5 kV isolation.

<table>
<thead>
<tr>
<th>Testing Authority</th>
<th>Component Standard</th>
<th>Isolation Rating</th>
<th>Digital Isolators</th>
<th>ISO Drivers</th>
<th>Isolated Amplifiers</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL</td>
<td>UL 1577</td>
<td>2.5 kV_{RMS}</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.75 kV_{RMS}</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 kV_{RMS}</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>VDE/IEC</td>
<td>VDE-0884-10, IEC 60747-5-5</td>
<td>BASIC REINFORCED</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

NOTE: All products are also compliant with CSA 5A and CQC GB4943.1 component standards. Please see product datasheets for compliance to equipment standards such as IEC 60950, 61010, 60601, etc.

Online Support

Identify the development tools you need for your isolation design

skyworksinc.com/en/Products/Isolation

Isolation Bootstrap Calculator

The web-based Isolation Bootstrap Calculator helps you determine the required CB recharge current at MAX and MIN duty cycle, and provides the information required to determine the best fit bootstrap module.

skyworksinc.com/tools/bootstrap-calculator

Isolator Power Consumption Calculator

The web-based Isolator Power Consumption Calculator utility helps you define basic information about your isolation set-up, and determine your power budget. Simply select the settings that match your design and obtain detailed power and current data.

skyworksinc.com/tools/isolator-power-calculator
To demonstrate the low power, reliability and performance of Skyworks’ digital isolators, we offer the Si86xx digital isolated communications reference design kit.

**Si86xxCOM-KIT**

To demonstrate the low power, reliability and performance of Skyworks’ digital isolators, we offer the Si86xx digital isolated communications reference design kit.