Microchip Next generation SiC MOSFETs offer superior dynamic and thermal performance over conventional Si MOSFETs and IGBTs. These devices offer low capacitance and gate charge, fast switching speed, fast and reliable body diode and stable operation at high junction temperatures of 175 deg C. These features enable high efficiency with low switching and conduction losses and eliminates the need for external freewheeling diode which lowers BOM cost and circuit board space. AEC-Q101 qualified products are also available.

Microchip’s AgileSwitch® family of digital programmable gate drivers, develops transformative technology that dramatically improves the performance and efficiency of electric vehicle and renewable energy applications. AgileSwitch drivers can be fully customized to meet the needs and demands of virtually any customer application. Unlock the full potential of Microchip SiC modules with AgileSwitch gate driver products.

### SiC Companion Solutions

**Microchip** Next generation SiC MOSFETs offer superior dynamic and thermal performance over conventional Si MOSFETs and IGBTs. These devices offer low capacitance and gate charge, fast switching speed, fast and reliable body diode and stable operation at high junction temperatures of 175 deg C. These features enable high efficiency with low switching and conduction losses and eliminates the need for external freewheeling diode which lowers BOM cost and circuit board space. AEC-Q101 qualified products are also available.

Microchip’s AgileSwitch® family of digital programmable gate drivers, develops transformative technology that dramatically improves the performance and efficiency of electric vehicle and renewable energy applications. AgileSwitch drivers can be fully customized to meet the needs and demands of virtually any customer application. Unlock the full potential of Microchip SiC modules with AgileSwitch gate driver products.

### Driver Cores

<table>
<thead>
<tr>
<th>Driver Cores</th>
<th>Plug and Play</th>
<th>Adapter Boards</th>
<th>Accelerated Dev Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2ASC-12A1HP</td>
<td>2ASC-17A1HP</td>
<td>62EM1-00001</td>
<td>ASDAK-2ASC</td>
</tr>
<tr>
<td>20A / 200kHz</td>
<td>20A / 100kHz</td>
<td>Plug and Play Driver</td>
<td>ASDAK-MSCSM</td>
</tr>
<tr>
<td>10A / 150kHz</td>
<td></td>
<td>62CA1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>62CA4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SP6CA1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SP6CA3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>62CA1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>62CA4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SP6CA1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SP6CA3</td>
<td></td>
</tr>
</tbody>
</table>

#### ASDAK-2ASC kits include:
- 3x 2ASC-12A1HP 1200V Cores
- 1x SP6CA1 SP6LI mod. Adapt. Bd.
- 1x SP6LI module
- 1x 62CA1 Device programmer kit
- 1x AgileSwitch Intell Config. Tool Software

#### ASDAK-MSCSM kits include:
- 1x 2ASC-12A1HP 1200V Cores
- 1x SP6CA1 SP6LI mod. Adapt. Bd.
- 1x SP6LI module
- 1x 62CA1 Device programmer kit
- 1x AgileSwitch Intell Config. Tool Software

### Adapter Boards include:
- Direct low-Ind. conn. to module
- Mount. conn. for 2ASC driver core
- 20-pin input conn.
- Parall main/sec driver conn
- Gate resistors/bias circuitry

### Driver Cores include:
- Microchip Prog. gate driver IC
- Software Config +/- Vgs
- Pat. Augmented Switch
- Pat. Short-Cir Protec.
- Advan. Mon./Fault Report
- Gate resistors/bias circuitry

### Adapter Boards include:
- Direct low-Ind. conn. to module
- Mount. conn. for 2ASC driver core
- 20-pin input conn.
- Parall main/sec driver conn
- Gate resistors/bias circuitry

**To find more information, access our full design support capabilities, or to purchase these products today, visit richardsonrfpd.com.**
ADI Isolated Gate Driver Product Features

Isolated gate drivers provide electrical isolation as well as strong gate drive capability, which is often required for safety and robustness in many system architectures. The isolated gate driver portfolio from Analog Devices offers designers performance and reliability advantages over optocouplers or pulse transformers by utilizing ADI’s proven iCoupler® technology. The isolated gate driver family offers the advantage of a maximum propagation delay of 50 ns, less than 5 ns channel-to-channel matching, up to 150kV/use Common Mode Transient Immunity (CMTI), and output voltages to cover all SiC and GaN drive levels.

<table>
<thead>
<tr>
<th>Package</th>
<th>Voltage</th>
<th>Basic</th>
<th>Protecting</th>
<th>Programmable</th>
</tr>
</thead>
<tbody>
<tr>
<td>D3</td>
<td>700V, 1200V</td>
<td>AC</td>
<td>AC</td>
<td>AC</td>
</tr>
<tr>
<td>SP1</td>
<td>700V, 1200V, 1700V</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>SP3F</td>
<td>700V, 1200V</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>SP4</td>
<td>700V</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>SP6</td>
<td>700V, 1200V</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>SP6LI</td>
<td>700V, 1200V, 1700V</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>SP6P</td>
<td>700V, 1200V</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>B</td>
<td>700V, 1200V, 1700V</td>
<td>G</td>
<td>G</td>
<td>H</td>
</tr>
<tr>
<td>B4</td>
<td>700V, 1200V</td>
<td>G</td>
<td>G</td>
<td>H</td>
</tr>
<tr>
<td>S</td>
<td>700V, 1200V, 1700V</td>
<td>G</td>
<td>G</td>
<td>H</td>
</tr>
<tr>
<td>J</td>
<td>1200V</td>
<td>G</td>
<td>G</td>
<td>P</td>
</tr>
</tbody>
</table>

AC- Auto Capable
AQ- Auto Qualified
G- General Recommendation
H- Preferred for Half-Bridge Config
P- Preferred for paralleling Devices
V- Use with 1700V Devices

BASIC
• Low Pin Count
• Small Footprint
• Low Delay
• Bipolar Supplies
• Typical applications:
  • OBC, DC / DC

PROTECTING
• Low Delay
• High CMTI
• Bipolar Supplies
• Integrated Protection
• Error Reporting (flag)
• Typical applications:
  • Traction Inverter
  • Industrial / Energy Systems

PROGRAMMABLE
• Low Delay
• High CMTI
• Bipolar Supplies
• Integrated Protection/Monitoring
• Status Reporting (Flag + SPI)
• Fly-back Controller
• SPI Configurable
• Typical applications:
  • Traction Inverter
  • High Performance Industrial / Energy Systems
RECOM High-isolation 2W DC/DC Converters for SiC Gate Drivers

Switching SiC MOSFETs requires turn-on and turn-off voltages that are uncommon for other IGBT or MOSFET applications. RECOM provides high-isolation DC-DC converters with both single and dual asymmetric outputs to match the recommended gate drive levels of various SiC MOSFETs for optimized switching.

<table>
<thead>
<tr>
<th>Series</th>
<th>Power (W)</th>
<th>Vin (V)</th>
<th>Nr. of Outputs</th>
<th>Vout 1 (V)</th>
<th>Vout 2 (V)</th>
<th>Mounting Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>RKZ-xx2005</td>
<td>2.0</td>
<td>5.0, 12.0, 15.0, 24.0</td>
<td>2</td>
<td>20.0</td>
<td>-5.0</td>
<td>THT</td>
</tr>
<tr>
<td>RxxP21503</td>
<td>2.0</td>
<td>12.0, 15.0, 24.0</td>
<td>2</td>
<td>15.0</td>
<td>-3.0</td>
<td>THT</td>
</tr>
<tr>
<td>RxxP22005</td>
<td>2.0</td>
<td>5.0, 12.0, 15.0, 24.0</td>
<td>2</td>
<td>20.0</td>
<td>-5.0</td>
<td>THT</td>
</tr>
<tr>
<td>RxxP2155</td>
<td>2.0</td>
<td>5.0, 12.0, 15.0, 24.0</td>
<td>1</td>
<td>15.0</td>
<td>-</td>
<td>THT</td>
</tr>
<tr>
<td>RxxP2155/R</td>
<td>2.0</td>
<td>5.0, 12.0, 15.0, 24.0</td>
<td>1</td>
<td>15.0</td>
<td>-</td>
<td>THT</td>
</tr>
<tr>
<td>RxxP22005D</td>
<td>+20/-5</td>
<td>5, 12, 15, 24</td>
<td>2</td>
<td>Yes</td>
<td>-5.0</td>
<td>THT</td>
</tr>
</tbody>
</table>

4000-series Cold Plates for Microchip Modules

Wieland-Microcool 4000 series Friction Stir Welded coldplates have been optimized specifically for the high heat flux of silicon carbide power modules. The Micro Deformation Technology (MDT™) inside allows for the very low thermal resistance, low pressure drop and balanced parallel flow. The new 4000 series coldplates are thinner and can have cooling on both sides. Custom designs, internal nickel plating, fitting options, and MDT™ pin fin density options are all available with no tooling and quick lead times.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Dimensions (mm)</th>
<th>Fin Spacing (mm)</th>
<th>Module Compatibility</th>
<th># of Modules</th>
<th>Thermal Res @ 24L/min FR (C/W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP4009-STD</td>
<td>130 × 225 × 20</td>
<td>1</td>
<td>D3/SP6/SP6P/SP6LI</td>
<td>3</td>
<td>0.007</td>
</tr>
<tr>
<td>CP4009-XP</td>
<td>130 × 225 × 20</td>
<td>0.5</td>
<td>D3/SP6/SP6P/SP6LI</td>
<td>3</td>
<td>0.006</td>
</tr>
<tr>
<td>CP4009D-STD</td>
<td>130 × 225 × 22</td>
<td>1</td>
<td>D3/SP6/SP6P/SP6LI</td>
<td>6 (Double sided)</td>
<td>0.004</td>
</tr>
<tr>
<td>CP4009D-XP</td>
<td>130 × 225 × 22</td>
<td>0.5</td>
<td>D3/SP6/SP6P/SP6LI</td>
<td>6 (Double sided)</td>
<td>0.003</td>
</tr>
</tbody>
</table>

* Custom sizes also available.
### High Power 3-Phase Inverter

Example of a high power 3-phase inverter using Microchip SiC half-bridge module in ultra low inductance SP6LI package. Greater efficiency, power density and optimization of performance is further enhanced with AgileSwitch programmable gate driver core and adapter board, featuring augmented switching technology capable of 150kHz frequency.

### 30kW Vienna Rectifier

Example of a 30kW 3-phase Vienna Power Factor Correction (PFC) design utilizing Microchip next generation SiC Schottky barrier diodes and MOSFETs. In addition to the SiC devices, ADI offers gate driver ICs with high CMTI, low prop delay and protection features that match well with SiC. RECOM high isolation DC-DC converters with asymmetric output voltages to match SiC gate drive levels, can be used with ADI drivers for a simplified and effective SiC gate drive circuit.

### Applications:
- Motor Drives
- Traction Inverters
- High-efficiency Converters
- Grid-tied Power Generation

---

**Microchip SiC Devices**
- Microchip SP6LI SiC Module
- AgileSwitch Adapter Board For SP6LI Package
- AgileSwitch High Perform Driver Core
- Wieland Microcool High Performance Coldplate

**380/400 VAC 3-Phase Input**

**700VDC Output**

---

**Applications:**
- EV/HEV Battery Chargers
- PFC for high power SMPS