INNOVATIVE CURRENT SENSING FOR VEHICLE ELECTRIFICATION

CHARGE INTO THE FUTURE OF VEHICLE ELECTRIFICATION WITH THE WORLD’S #1 SUPPLIER OF CURRENT SENSOR ICS FOR LEADING EV APPLICATIONS
Allegro MicroSystems has been driving innovation in the current sensor industry for nearly two decades, with a history of first-to-market products that give our customers a competitive edge. Our advanced ICs help you achieve higher efficiency and power density in your designs.

We’re leading the market in main traction motor and auxiliary inverters for electric vehicles, and OEMs trust Allegro for applications like DC-DC converters and on-board chargers.

We also shine at high voltage with industry-leading galvanic isolation ratings of up to 1100 VRMS.

**Wherever current sensing is needed, an Allegro sensor IC can provide a solution.**

### 0 to >1000 A Sensor ICs

- Industry-leading offset and sensitivity accuracy from –40°C to 150°C.
- With typical accuracy of 1% over temperature, our current sensors enable precise electric drive, steering, and braking with higher efficiency
- Customer programmable for both offset and sensitivity
- Packaged in a 1 mm thick SIP or TSSOP package for easy assembly
- High bandwidth (up to 240 kHz) for short circuit and overcurrent detection
- Integrated safety features, like integrated fault outputs, reduce BOM and system complexity
- User-programmable overcurrent fault output

**Industry-first core free and shield free current sensing solutions - Allegro’s coreless current sensors are safe, accurate, and easy to use. Eliminate the core in traction motor inverters, lowering cost and enabling higher power density solutions**

#### Current Sensor ICs

<table>
<thead>
<tr>
<th>Type</th>
<th>Part Number</th>
<th>Typical Sensitivity (mV/G)</th>
<th>Quiescent Output (V)</th>
<th>Bandwidth (kHz)</th>
<th>Supply Voltage (V)</th>
<th>Temperature Ranges</th>
<th>Packages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bidirectional, Unidirectional</td>
<td>ACS37610</td>
<td>2, 10, 20</td>
<td>50% VCC (Bi) 10% VCC (Uni)</td>
<td>140, 240</td>
<td>3.3, 5</td>
<td>L</td>
<td>TSSOP</td>
</tr>
<tr>
<td>Bidirectional, Unidirectional</td>
<td>ACS37612</td>
<td>5, 10, 15</td>
<td>50% VCC (Bi) 10% VCC (Uni)</td>
<td>140, 240</td>
<td>3.3, 5</td>
<td>L</td>
<td>TSSOP</td>
</tr>
<tr>
<td>Bidirectional</td>
<td>ACS70311</td>
<td>1, 2.5, 5, 10</td>
<td>50% VCC</td>
<td>240</td>
<td>5</td>
<td>L</td>
<td>SIP</td>
</tr>
</tbody>
</table>

Temperature range codes: S = −20°C to 85°C, E = −40°C to 85°C, K = −40°C to 125°C, L = −40°C to 150°C

The current sensor IC families are innovative, monolithic, isolated Hall-effect-based devices that provide a fully-integrated solution in industry-leading, small-sized packages.
Innovative Current Sensor ICs

0 to 400 A Integrated Conductor Sensor ICs

- Innovative, fully integrated current sensor solutions are safe, accurate, and easy to use
- Automotive-grade devices deliver highly accurate open-loop current sensing
- Broad sensing range with 0.1 to 1 mΩ resistance improves efficiency across a variety of EV systems
- Reliable range provides high galvanic isolation, making for flexible solutions ideal for use in line-side or high-voltage applications
- CB package integrated core sensors increase ease of use, reducing development and integration time and effort
- Allegro current sensors are much smaller than bulky current transformers, reducing footprint within systems and increasing overall efficiency

Allegro’s 0 to 400 A sensors offer highly accurate, industry-proven, fully integrated solutions that can help minimize footprint and BOM for resource-conscious users.

<table>
<thead>
<tr>
<th>Type</th>
<th>Part Number</th>
<th>Measurement Range (A)</th>
<th>Isolation Voltage (VRMS)</th>
<th>Bandwidth (kHz)</th>
<th>Vcc</th>
<th>Temperature Ranges</th>
<th>Packages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bidirectional, Unidirectional</td>
<td>ACS772</td>
<td>±50, ±100, ±150, ±200, ±400, 50, 100, 150, 200, 250</td>
<td>4800</td>
<td>200</td>
<td>5</td>
<td>E,K,L</td>
<td>CB</td>
</tr>
<tr>
<td>Bidirectional, Unidirectional</td>
<td>ACS773</td>
<td>±50, ±100, ±150, ±200, 250</td>
<td>4800</td>
<td>200</td>
<td>3.3</td>
<td>E,K,L</td>
<td>CB</td>
</tr>
<tr>
<td>Bidirectional, Unidirectional</td>
<td>ACS72981</td>
<td>±50, ±100, ±150, 50, 100, 150</td>
<td>120</td>
<td>250</td>
<td>3.3,5</td>
<td>K,L</td>
<td>LR</td>
</tr>
<tr>
<td>Bidirectional, Unidirectional</td>
<td>ACS37002MC</td>
<td>±33.3, ±40, ±50, ±66.7, ±80 ±100, ±108, ±133.3, ±135, ±180, 33.3, ±40, ±50, ±66.7</td>
<td>5000</td>
<td>400</td>
<td>3.3,5</td>
<td>L</td>
<td>SOIC</td>
</tr>
</tbody>
</table>

See figures 2 and 5 illustrations on back cover

0 to 50 A Integrated Conductor Sensor ICs

- Factory programmed to maximize device accuracy over temperature, providing typical output error as low as 1%
- Grade 0 Automotive-qualified current sensors provide an ideal replacement to current transformers in a reliable, minimal package
- User-programmable overcurrent fault output reduces BOM
- Excellent magnetic coupling in a coreless package design providing best-in-class SNR and up to 5000 VRMS of galvanic isolation
- Small packaging and full integration does not require shunts, enhancing reliability
- Low resistance internal conductor allows for sensing up to 50 A continuous current, lowering heat budgets and enabling higher power densities

Allegro’s 0 to 50 A sensors enable efficient and accurate charging systems and DC-DC Converters, used in various systems across EVs.

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<tr>
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<th>Isolation Voltage (VRMS)</th>
<th>Bandwidth (kHz)</th>
<th>Vcc</th>
<th>Temperature Ranges</th>
<th>Packages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bidirectional, Unidirectional</td>
<td>ACS71240EX</td>
<td>&lt;±10, ±30, 50</td>
<td>120</td>
<td>120</td>
<td>3.3, 5</td>
<td>K</td>
<td>QFN</td>
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<tr>
<td>Bidirectional, Unidirectional</td>
<td>ACS71240LC</td>
<td>&lt;±10, ±30, ±45, 50</td>
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<td>120</td>
<td>3.3, 5</td>
<td>L</td>
<td>SOIC</td>
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<tr>
<td>Bidirectional, Unidirectional</td>
<td>ACS37002MA</td>
<td>±33, ±40, ±50, ±66, ±80, ±100, ±133, 33, 40, 50, ±66, ±80, ±100, ±133</td>
<td>5000</td>
<td>400</td>
<td>3.3, 5</td>
<td>K, L</td>
<td>SOIC</td>
</tr>
<tr>
<td>Bidirectional, Unidirectional</td>
<td>ACS37002LA</td>
<td>±10, ±12, ±15, ±20, ±25, ±30, ±37.5, ±50, ±25, ±30, ±37.5, ±50</td>
<td>3600</td>
<td>400</td>
<td>3.3, 5</td>
<td>L</td>
<td>SOIC</td>
</tr>
<tr>
<td>Bidirectional, Unidirectional</td>
<td>ACS37002MC</td>
<td>±33.3, ±40, ±50, ±66.7, ±80 ±100, ±108, ±133.3, ±135, ±180, 33.3, ±40, ±50, ±66.7</td>
<td>5000</td>
<td>400</td>
<td>3.3, 5</td>
<td>L</td>
<td>SOIC</td>
</tr>
</tbody>
</table>

See figures 3, 4 and 6 illustrations on back cover
Small Form Factor, High Bandwidth Hall-Effect Sensor IC Solutions

Key Features

- Industry’s highest bandwidth, up to 1 MHz
- Lower power loss than shunt-based solutions
- Industry-Leading accuracy, as high as 1% typical
- Monolithic Hall and GMR sensors offer full integration
- Smaller form factor than shunt and current transformer solutions
- Able to measure both AC and DC currents
- Differential sensing for rejection of stray magnetic fields
- Up to 5 kV\textsubscript{RMS} certified isolation rating
- Single supply operation, 3.3 V and 5 V available

See how Allegro is moving the world toward a safe and sustainable future

Learn more about Allegro Current Sensor ICs at www.allegromicro.com/currentsensors