

Current Sensors And Fan Driver For E-Mobility And Industrial Automation

[Allegro MicroSystems'](#) ACS37035 and ACS37630 current sensors, and the A89347 automotive-grade fan driver IC offer advanced capabilities to enhance motor control and thermal management performance in e-mobility and industrial automation applications.

"The ACS37035 and ACS37630 provide industry-leading accuracy and noise immunity for precise motor control for demanding applications such as robots, industrial motors and electric vehicle traction inverters. The A89347 fan driver IC ensures quiet, reliable operation in seat- and battery-cooling applications in the e-mobility space. We are excited to highlight these products as a forward-looking solution for simplifying design, improving overall system efficiency, and empowering our customers to innovate and deliver exceptional value," said Ram Sathappan, vice president of Global Marketing and Applications at Allegro.

Allegro's ACS37035 high-accuracy current sensor boasts a 1-MHz bandwidth and 0.45- μ s typical response time, enabling precise measurement of high-frequency currents in fast control loops. Its differential sensing capability, combined with a CMRR of 4 mA/Gauss, provides high immunity to external magnetic fields, ensuring accurate measurements even in noisy environments (Fig. 1).

With a $\pm 3\%$ sensitivity error over temperature and a maximum offset voltage of ± 15 mV, the sensor minimizes error and improves system performance. This high level of precision and noise immunity enables tighter control loops, resulting in improved motor efficiency, reduced power consumption, and smoother operation. Target applications include motor control, load detection and management, and switch-mode power supplies.

Designed for U-core current sensing applications like xEV traction inverter and battery management systems, the ACS37630 offers high bandwidth (up to 250 kHz) and a fast analog output with a 1.6- μ s typical response time. Its vertical Hall technology enables sensing parallel to the package surface, which is well suited for system integration with U-core magnets. This contactless, non-invasive current sensing solution eliminates the need for C-core magnets, simplifying assembly and reducing system complexity (Fig. 2).

With a sensitivity of $\pm 0.7\%$ and offset of ± 5 mV, the ACS37630 provides precise current measurements over the full automotive Grade 0 operating temperature range of -50°C to $+150^{\circ}\text{C}$. A simplified design and high accuracy reduce current sensing system design and manufacturing complexity while lowering costs and improving system reliability, says the vendor.

Meanwhile, the A89347 is an automotive-grade, sensorless sinusoidal three-phase BLDC driver for EV seat- and battery-cooling fans. It offers integrated closed-loop speed control, minimizing vibration and audible noise. Additionally, a customizable speed curve, configured via EEPROM, allows for tailored performance in various fan applications (Fig. 3).

The A89347 features slew rate control, lock detection, and a low-power standby mode with a current consumption of just 10 μ A. Flexible control contributes to quieter, more efficient fan operation, while lower power consumption extends battery life. This AEC-Q100 qualified IC ensures reliable operation in automotive environments.

The ACS37035 and ACS37630 are available now, and the A89347 will be available this summer. All devices will include evaluation boards and comprehensive support resources to assist customers with design and development. To learn more about Allegro's latest motor control and thermal management solutions, see the [ACS37035](#), [ACS37630](#) and [A89347](#) pages.

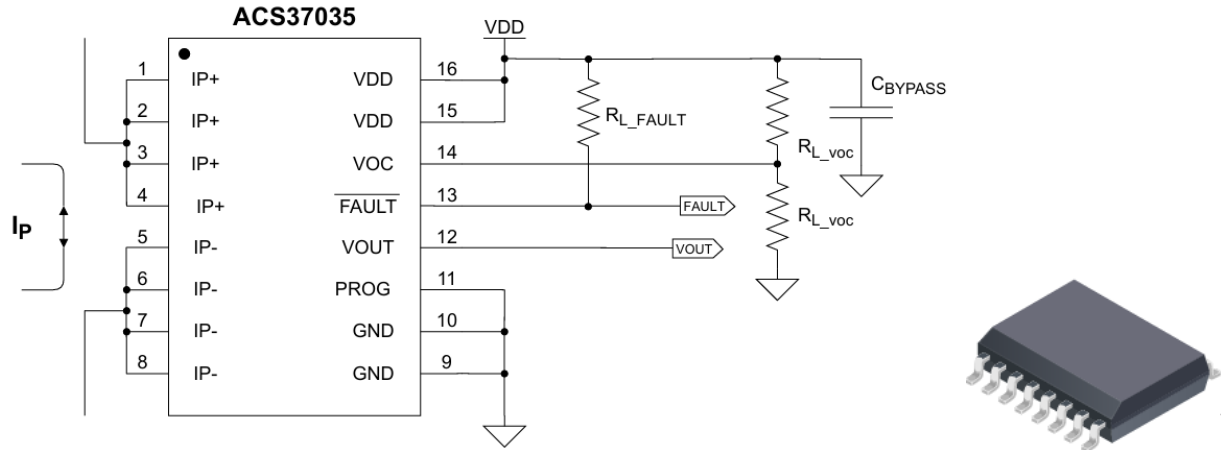


Fig. 1. Typical application circuit for the ACS37035 high-accuracy current sensor (left). The IC outputs an analog VOUT that varies linearly with the primary current, I_p , within the specified ranges. The device is offered in a 16-pin wide-body SOIC (right).

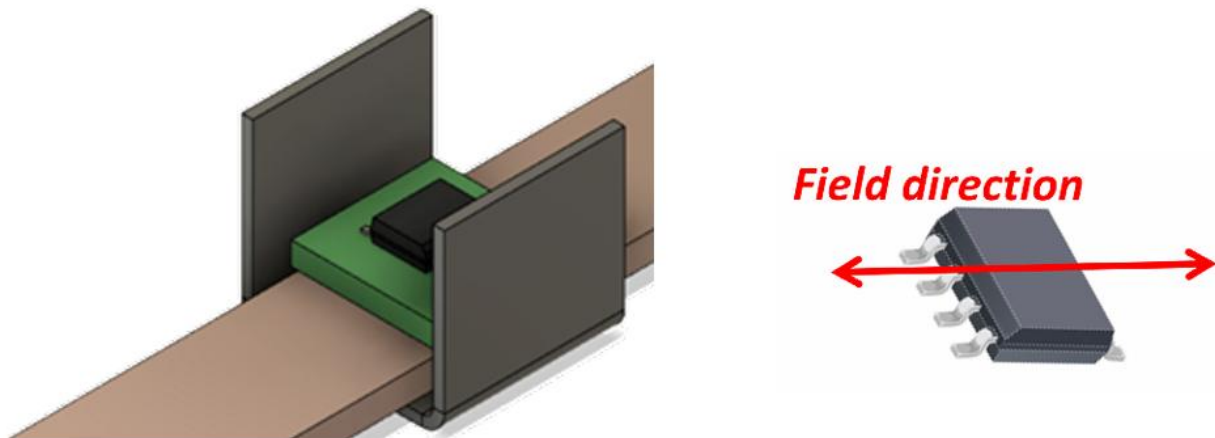


Fig. 2. U-Core application schematic (left) and sensed field direction for the ACS37630 linear vertical Hall-Effect sensor IC. It's designed for applications where current flows through a busbar or PCB. When used with a U-core concentrator, high immunity to stray fields can be achieved, as well as simplified mechanical assembly relative to a traditional C-core current sensor.



Fig. 3. The A89347 40-V three-phase sensorless BLDC fan driver IC is said to offer whisper-quiet operation in automotive applications such as seat cooling fans, HVAC blowers, and other thermal management systems. The device includes closed-loop speed control with sinusoidal drive to minimize vibration and noise, and integrates EEPROM customization to enable optimized performance and efficiency.