

# INDUSTRY'S FIRST ASIL C FIELD CURRENT SENSOR FOR EMOBILITY

ASIL

The ideal solution for the highest levels of accuracy and reliability in safety-critical systems for automotive applications

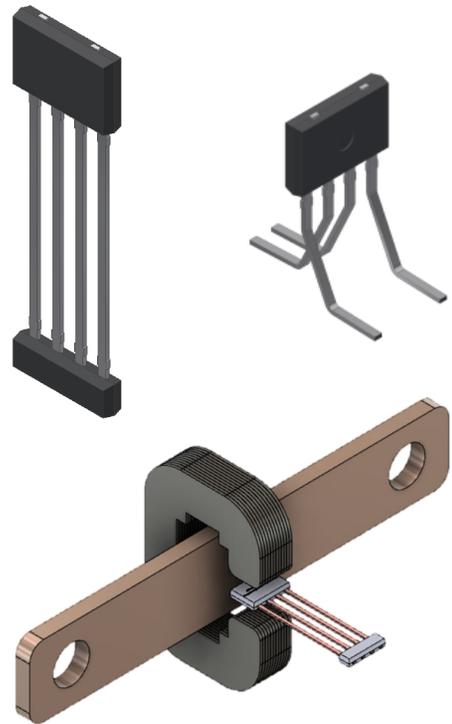
The ACS37601 is Allegro's latest and most advanced linear Hall-effect sensor IC for core-based current sensing, developed in accordance with the ISO 26262 functional safety standard to achieve an ASIL C safety rating. A sensitivity error of  $\pm 0.8\%$ , zero-amp output voltage offset  $< \pm 5$  mV, temperature range of  $-40^{\circ}\text{C}$  to  $150^{\circ}\text{C}$ , and an overcurrent and overtemperature dedicated pin make it ideal for automotive safety-critical applications.

The high levels of safety and accuracy enable Traction Inverter and Battery Management Systems designers to increase system efficiency, extend battery life, and easily meet their safety goals.

The ASIL C safety rating is achieved through state-of-the-art sensing signal paths and diagnostics. A dedicated programmable overcurrent and overtemperature pin provides additional protection against short-circuits.

The ACS37601 features advanced Hall elements, resulting in 30% noise reduction relative to legacy devices, while maintaining a response time of  $2 \mu\text{s}$  and bandwidth of 240 kHz. 5 V and 3.3 V operation supports the adoption of the most advanced microprocessors without requiring additional components.

The IC is offered in an extremely thin (1 mm-thick), 4-pin single in-line package (SIP), known as the KT package. The KT package is available in straight leads (suffix TN) as well as a lead-formed option (suffix TH), enabling surface-mount assembly and a high tolerance to mechanical vibration.



**The KT package comes in two distinct options enabling flexibility based on designers' needs. The sensor is a core-based solution, seen here with a busbar.**

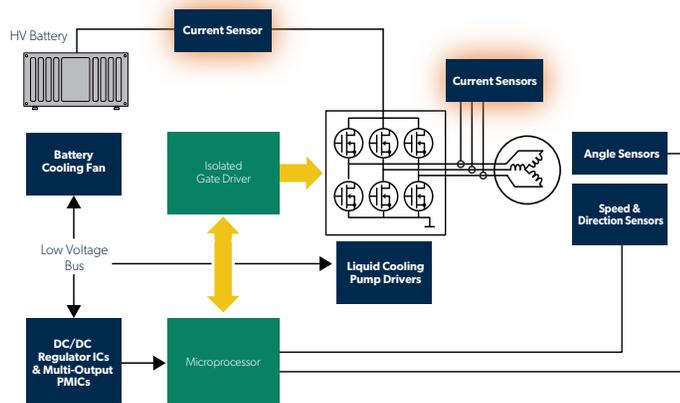
## Features and Benefits

- ASIL C safety rating
- Ultra-low thermal drift
  - Sensitivity  $\pm 0.8\%$
  - Offset  $< \pm 5$  mV
- Overcurrent and overtemperature fault output
- Industry-leading noise performance
- $V_{CC}$  operation: 3.3 and 5 V
- Quick response time ( $2 \mu\text{s}$ ) with 240 kHz bandwidth

## Applications

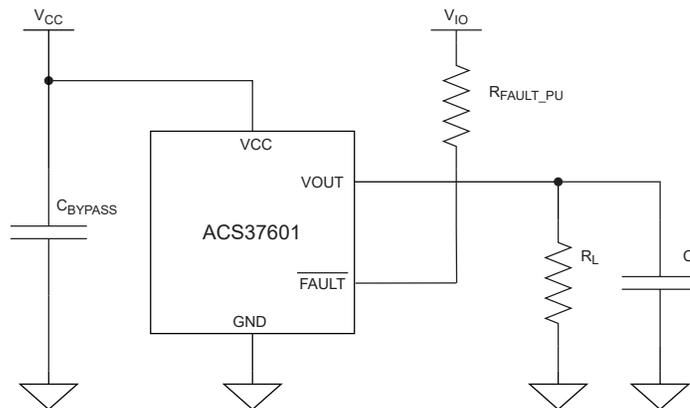
- High voltage traction motor inverters
- 48 V / 12 V auxiliary inverters (starter generators)
- Battery monitoring systems
- Power distribution units (PDU)
- Power relay assemblies (PRA)
- Overcurrent detection
- DC/DC converters
- Smart fuses

## High Voltage Traction Motor Inverter Block Diagram



A block diagram for a high voltage traction motor inverter, a common application for the ACS37601, is shown to the left. The current sensors within the diagram are seen highlighted in orange, indicating where the ACS37601 is utilized in the inverter.

## Typical Application



## Selection Guide

Part Number	Factory-Programmed Sensitivity (mV/G)	Programmable Sens Range (mV/G)	Output Mode	Nominal VCC (V)	TA (°C)	Package
<a href="#">ACS37601LKTATN-0P5B5-C</a>	0.5	0.50 to 0.86	Ratiometric	5	-40 to 150°C	4-Pin SIP
<a href="#">ACS37601LKTATN-001B5-C</a>	1	0.83 to 1.44	Ratiometric	5	-40 to 150°C	4-Pin SIP

To learn more about the Allegro family of products and to explore available design resources, visit [allegromicro.com](http://allegromicro.com).