ACS37200: 200 AMPERE CURRENT SENSING WITH REINFORCED ISOLATION IN AN ULTRACOMPACT ISOLATED 100 mm² PACKAGE

Integrated Conductor Current Sensor Systems Engineering
Allegro MicroSystems

INTRODUCTION

The rapid expansion of electrification in automotive and industrial markets demands power electronic systems that are smaller, more efficient, and more reliable than ever before. Meeting these goals requires innovation at every level, and especially in how high currents are measured. Allegro MicroSystems rises to this challenge with the ACS37200, a groundbreaking current sensor that delivers a complete, high-performance solution in the new 8-pin PSOF "LX" package, shown in figure 1. This device integrates a low resistance current path, sensing elements, and signal conditioning into a single component capable of measuring up to 200A. As a factory calibrated sensor with 500 VRMS reinforced isolation and an exceptionally low conductor resistance of 50 μΩ, the ACS37200 offers a superior alternative to cumbersome modules and complex shunt-based designs.

This brief explores how the ACS37200 and its innovative LX package empower engineers to achieve next-generation performance and power density.

Figure 1: The Allegro LX package, an 8-pin PSOF, integrates a high-current conductor and sensing IC into a compact, surface mount form factor

INTEGRATED SAFETY: REINFORCED ISOLATION

In high-voltage systems, ensuring safe and reliable operation is paramount. The ACS37200 is engineered with safety at its core, featuring robust galvanic isolation built directly into the LX package. With a UL certified 500 VRMS reinforced isolation rating and 8 mm of creepage and clearance, the sensor provides a dependable barrier between the high-voltage path and the low-voltage control circuitry. This allows direct, high-side current sensing in applications like EV onboard chargers, solar inverters, and high-voltage motor drives without requiring additional external isolation components. The built-in isolation simplifies system design, reduces certification complexity, and lowers the total bill of materials.

BREAKTHROUGH POWER DENSITY IN A SURFACE MOUNT PACKAGE

One of the most significant advantages of the ACS37200 is the dramatic increase in power density that it enables. This is made possible by the innovative LX package, which occupies a total footprint of less than 100 mm². Compared to traditional current sensing modules, this is a remarkable 79% footprint reduction, freeing up valuable PCB real estate for other critical components or enabling smaller overall product size. Figure 2 shows a size comparison between the CB package and the LX package. As a true surface mount device (SMD), the LX package also streamlines the PCB manufacturing process, allowing for automated assembly and eliminating the manual steps associated with larger, through-hole components.

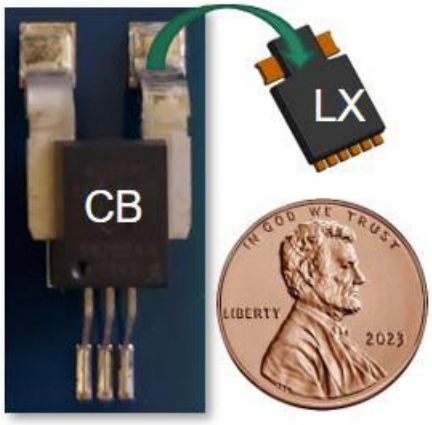

Figure 2: The LX package (right) offers a 78% smaller footprint compared to the traditional CB module (left), enabling significant board space savings and higher power density

SIMPLIFYING DESIGN WITH A FULLY INTEGRATED SOLUTION

Traditional high-current sensing often involves complex multi-component solutions. The ACS37200 simplifies this process by integrating all necessary functions into a single, compact device. As a factory calibrated system in a package, the ACS37200 provides a complete, out-of-the-box solution that eliminates the need for shunt resistors, precision amplifiers, and external isolation circuits. Figure 3 shows the typical application circuit for the ACS37200. It further simplifies system integration by providing two additional added features: an overcurrent FAULT output with adjustable threshold and a stable voltage reference output.

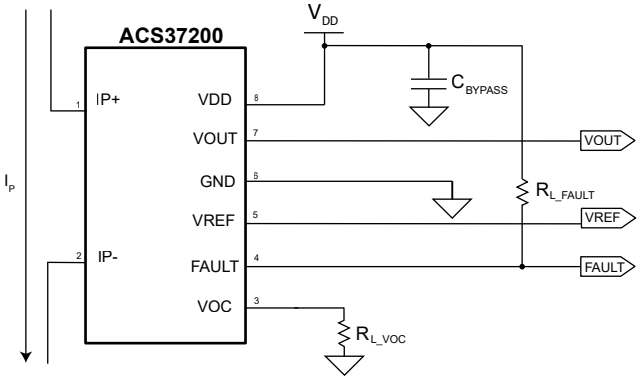

Figure 3: The typical application circuit for the ACS37200 highlights the minimal external components required for a complete, isolated high current sensing solution.

ENGINEERED FOR HIGH EFFICIENCY AND THERMAL RELIABILITY

High efficiency in power systems is directly tied to minimizing resistive losses. The ACS37200 excels thanks to the LX package's ultra-low primary conductor resistance of only 50 μΩ. This significantly reduces power loss (I^2R) and associated heat generation. The package is also expertly engineered for thermal management, efficiently conducting heat away from the sensor die and avoiding the formation of a thermal bottleneck on the PCB. The ACS37200 can reliably handle continuous DC currents of up to 160 A at a 25°C ambient temperature, all while maintaining a junction temperature below the 165°C maximum. This robust thermal performance is essential for maintaining reliability in demanding, high-power applications.

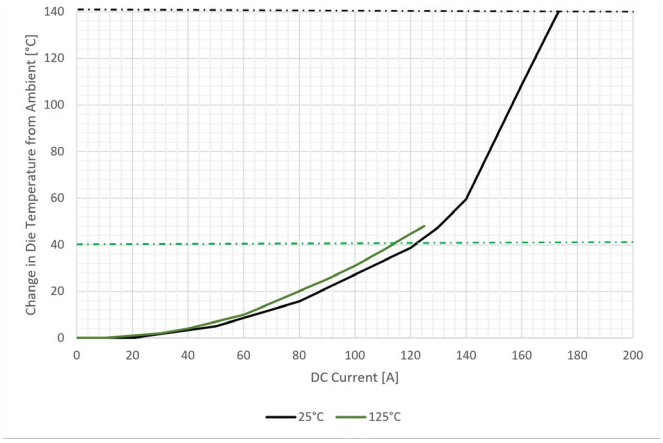

Figure 4: Change in die temperature of the ACS37200 versus continuous DC current at 25°C and 125°C ambient temperatures, as measured on the Allegro LX evaluation board

CONCLUSION

The Allegro ACS37200 represents a major advancement for the design of high-power systems. By combining robust reinforced isolation, best-in-class power density, and a full suite of integrated features, it solves the core challenges of size, efficiency, and design complexity. This device empowers engineers to develop next-generation power electronics that are smaller, more reliable, and more cost effective than ever before.

For additional information on the ACS37200, including evaluation boards, design resources, application information, and samples, visit the Allegro MicroSystems website.

Revision History

Number	Date	Description	Responsibility
–	February 23, 2026	Initial release	Tyler Hendrigan

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