

SiC Gate Driver Chipset Eliminates External Isolated Bias Supplies

[Allegro MicroSystems'](#) AHV85003/AHV85043 chipset is an addition to the company's Power-Thru isolated gate driver portfolio. Joining the flagship AHV85311 integrated solution, this expanded family creates a complete ecosystem for high-voltage SiC designs in AI data centers, electric vehicles (EVs), and clean energy systems. The solution simplifies the design challenge in power conversion by eliminating the need for external isolated bias supplies for gate drivers (Fig. 1). According to the company, this innovation delivers the industry's smallest solution footprint while reducing the bill of materials (BOM) to address the critical challenge of achieving maximum power density, especially in demanding 800-V systems.

Allegro's Power-Thru isolated gate drivers integrate signal and power across a single isolation barrier. This breakthrough approach reduces common-mode capacitance in the system by up to 15x, addressing a major source of noise that impacts efficiency. According to the vendor, the gate drivers deliver up to a 20-dB improvement in EMI performance, which boosts overall system efficiency and eliminates countless hours spent by designers resolving noise issues.

To ensure supply chain resilience, both the new AHV85003/AHV85043 chipset and the existing AHV85311 integrated solution support a multi-source SiC strategy. With selectable gate-to-source voltages (V_{gs}) of 15 V, 18 V, and 20 V, and adjustable regulated negative voltage, designers can easily swap between SiC FETs from different vendors without redesigning their boards.

Furthermore, the portfolio now offers two distinct implementation paths. The flagship AHV85311 integrated solution, which includes the isolation transformer, provides an all-in-one route for accelerating time-to-market. The versatile AHV85003/AHV85043 chipset empowers designers to optimize for cost and layout by selecting their own external transformer tailored for their specific isolation needs (Fig. 2).

"We are redefining what engineers should expect from a gate driver," said Vijay Mangtani, vice president and GM of High Voltage Power Products at Allegro MicroSystems. "With Power-Thru, we solved the fundamental physics problem of noise in high-voltage systems. Now, by offering both a chipset and an integrated solution, we are giving our customers a complete toolkit. Whether they need the plug-and-play speed of an integrated solution or the granular control of a chipset, they get the same game-changing efficiency and the freedom to use the SiC FETs of their choice."

Datasheets, samples, and recommended transformer options for the AHV85003/AHV85043 chipset are available [online](#).

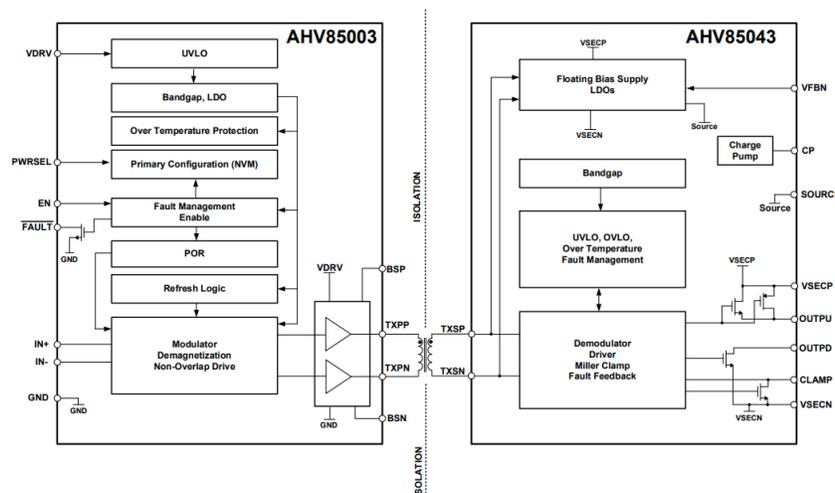
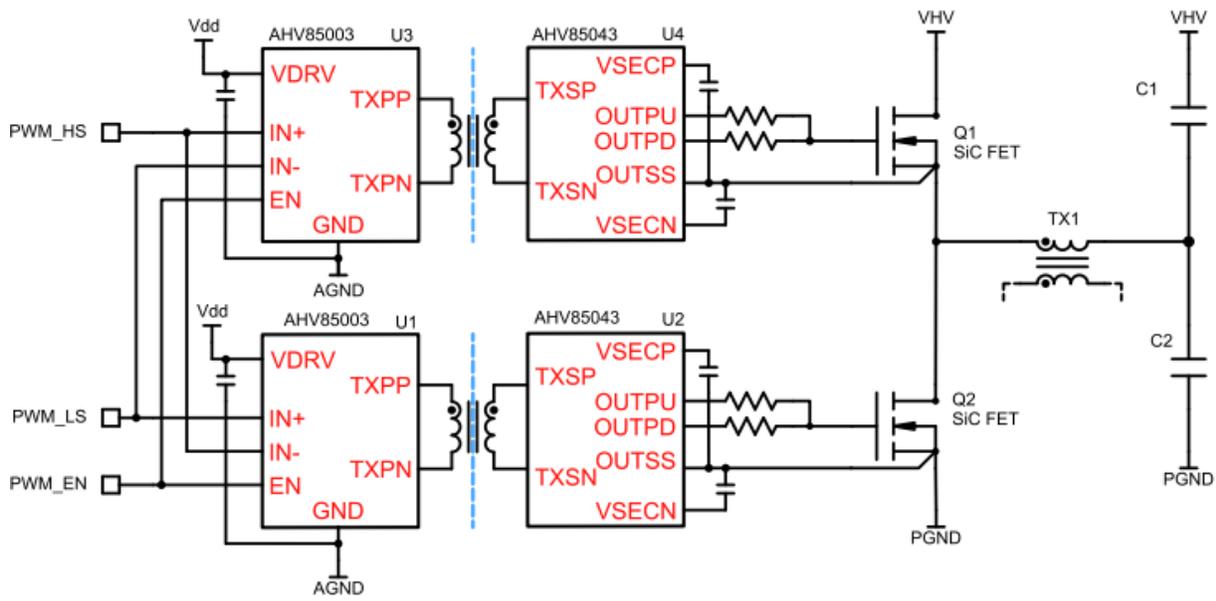
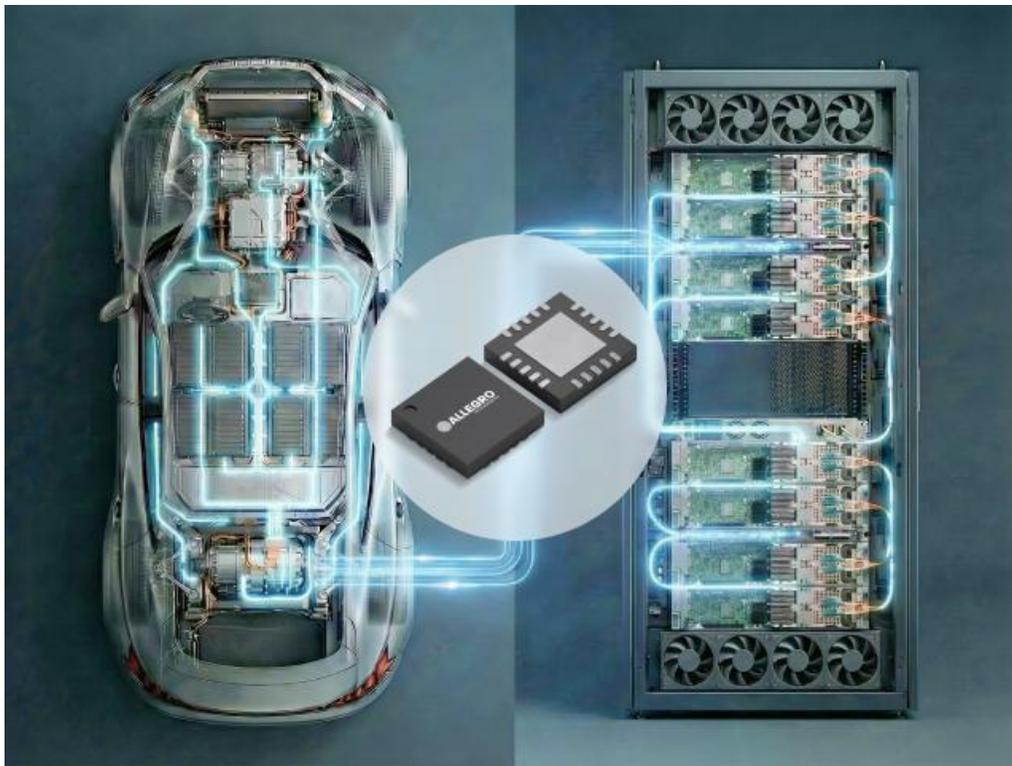


Fig. 1. Chipset functional block diagram. The AHV85003/AHV85043 self-powered, isolated SiC gate driver chipset transmits both PWM signals and all necessary gate-drive power across the isolation barrier using a single, compact external transformer, completely eliminating the need for a dedicated auxiliary bias supply or traditional bootstrap circuits.



(a)



(b)

Fig. 2. The chipset provides a bipolar output with an adjustable negative rail for robust SiC FET turn-off and enhanced dv/dt immunity, while the high-current (6 A) separate pull-up and pull-down outputs enable efficient, high-frequency switching. This highly integrated solution reduces system complexity and BOM cost, making it well suited for data center power supply units, automotive on-board chargers (OBCs), solar inverters, and industrial power applications. A simplified typical application circuit (a) and two application examples (b) are pictured here.