

FULL-BRIDGE GATE DRIVERS FOR AUTOMOTIVE AND INDUSTRIAL APPLICATIONS

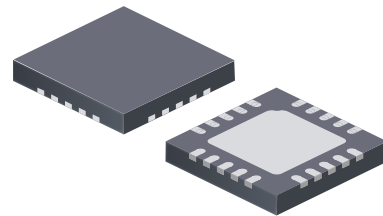
Silent, Reliable Solutions for Closure Systems and Relay Replacement

Many vehicles and industrial products depend on mechanical relay switches to control motors across applications. However, relays have finite lifespans, and as systems become increasingly electrified for safety and convenience, the components driving these systems must become smaller, more reliable, safer, and quieter.

The solid-state A89505 and A89506 are designed for a range of vehicle applications, including various actuators, EV charger locks, electronic parking brakes, and folding mirrors. Their solid-state design also makes them ideal for battery-powered applications that incorporate brushed DC motors such as building automation and robotics.

Available with direct control (A89505) and pulse-width modulation (A89506) options, these devices up-integrate critical features to make them ideal replacements for mechanical relays in applications that incorporate brushed DC motors, improving safety and reliability while reducing audible noise. Designers can also take advantage of smaller system footprints with fewer external components, reducing bills of materials (BOMs) and printed circuit board (PCB) sizes while increasing performance and improving the consumer experience.

The A89505 and A89506 have no moving parts and are smaller than most relays in use today. With built-in capabilities including flexible interface logic, EMI mitigation with programmable gate drive, motor current feedback and multiple diagnostic features, these devices require very few external components and are available in one of the industry's smallest packages.



20-Pin QFN (suffix ES) Package

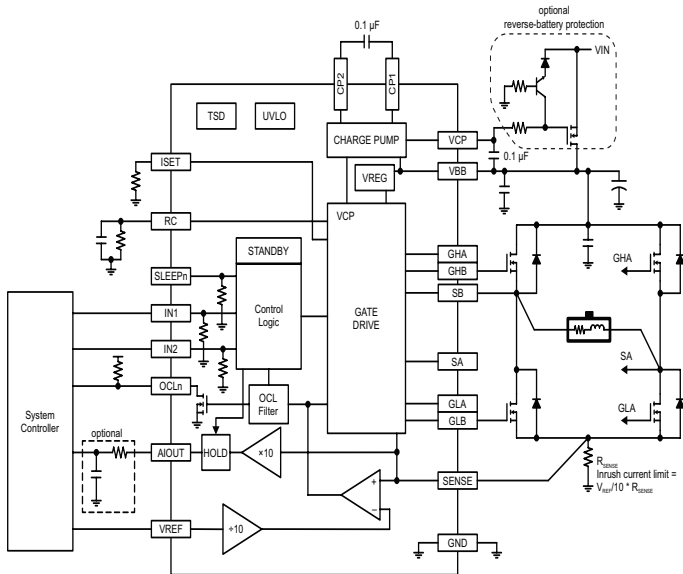


The A89505 and A89506 are ideal for automotive and industrial safety and convenience features that require longevity.

Features and Benefits

- Small leadless QFN package and up integration of diagnostic and current feedback reduces external BOM and PCB footprint
- Load current measurement aids in pinch detection and overdrive monitoring to overcome icing
- Contactless technology minimizes wear on components and extends product life
- Increased reliability reduces downtime and maintenance
- Silent solid-state design maintains quiet cabin conditions for driver comfort in electric vehicles, and is ideal for industrial applications

Integrated features increase design flexibility



Functional Block Diagram

The A89505 and A89506 gate drivers help provide better motor control than mechanical relays and reduce the need for external components. Adjustable slew rate control reduces EMI, helping to reduce the need for additional external filtering components. Load current feedback with overcurrent output flag and short circuit protection helps improve safety, providing diagnostic feedback for jam or pinch detection features.

Both gate drivers offer features that make them attractive compared to other common solutions. The A89505 and A89506 are capable of higher load dump voltages, with 50 V absolute maximum supply voltages. Both offer higher gate drive voltage at low VBB and better efficiency when running on battery power, allowing designers to specify lower-cost FETs. They even enable lower current draw in standby states to reduce total battery load

Programmable timing optimizes motor pulse-width modulation, allowing designers to select from a wide variety of MOSFETs. Both devices include current limit detection flags, which are triggered when the programmable current limit is reached. This feature allows a vehicle electronic control unit (ECU) to detect pinches or stalls, with the ability to overdrive a motor in case of ice or freezing.

Pricing and availability:

The A89505 and A89506 are available in a low-profile 4 × 4 mm, 20-contact QFN package (suffix “ES”) and a 20-lead eTSSOP (suffix “LP”), both with exposed thermal pad. For product pricing and samples, [contact an Allegro sales office or authorized distributor](#). For datasheets and more information on Allegro’s comprehensive magnetic position sensor family, including the A89505 and A89506, [please visit the Allegro website](#).

Ideal for automotive and industrial applications:

- Automated trunk open and close control
- Defroster on/off switch
- Electronically-controlled mirror folding mechanisms
- Building automation
- Sunroof and window controls
- Seat adjustment controls
- EV charging systems
- Robotics