

● **INNOVATIVE MOTOR CONTROL:**
SETTING A NEW STANDARD FOR
MOTOR DRIVE TECHNOLOGY



Brushless DC Drivers

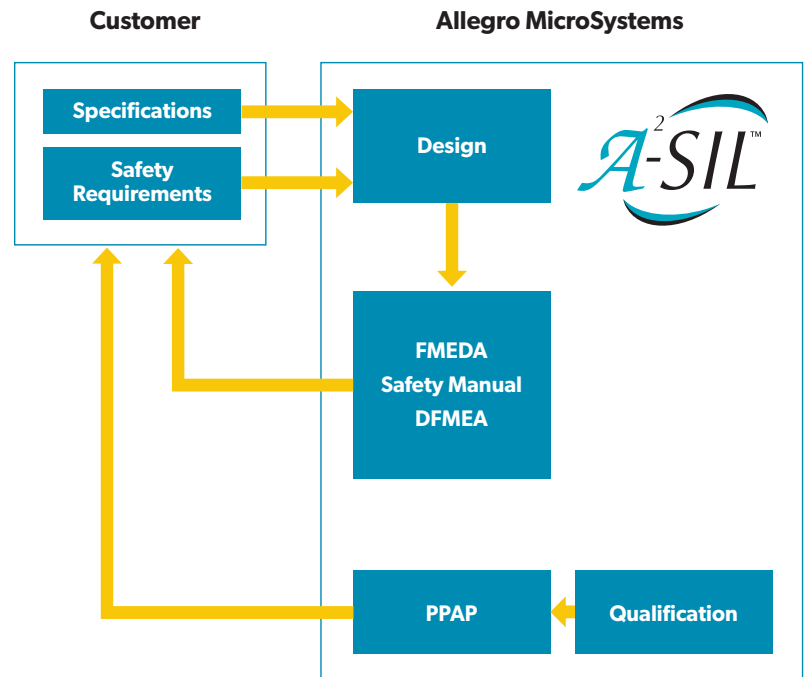
At Allegro MicroSystems, we're passionate about developing intelligent solutions that move the world toward a safer and more sustainable future – while giving our customers a competitive edge. With more than 50 years of experience developing advanced semiconductor technology and application-specific algorithms, Allegro is a global leader in power and sensing solutions for motion control and energy-efficient systems.

With decades of experience, our embedded motion control algorithms in our motor driver ICs simplify designs while improving motor performance and time to market.

Allegro plays a key role in enabling brushless DC motor adoption by simplifying the complexities of electronic commutation. We offer a range of products targeted at BLDC applications which span the industrial, consumer and computer markets (IC&C). Our broad offering of products developed to ISO 26262 helps our customers meet new safety-critical requirements.

A Flexible Solution Without Software

More demanding customer requirements have created a shift in motion control design that favors flexibility and improved time to market. Using Allegro's hardware-based algorithm, the solution is "plug-in and spin", eliminating the cycle of software development and debug and significantly reducing time to market. Flexibility is achieved by implementing a simple to use Graphical User Interface (GUI). Now, high performance and full-featured sensorless control is just a few mouse-clicks away.



Features

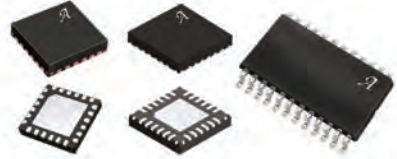
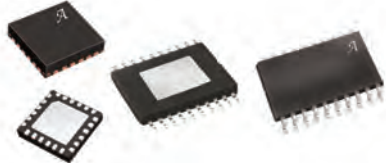

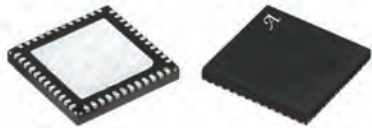
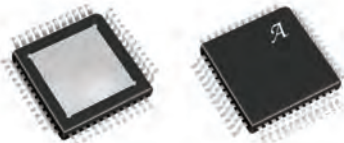
- Sensorless sinusoidal commutation
- Self-commutating hall-based drive with integrated state machine
- Back EMF sensing capability
- High-powered gate drive with advanced diagnostics and verification
- Features to support ASIL D safety goal compliance
- Closed-loop speed and torque control
- Wettable flank for Auto QFN

Applications

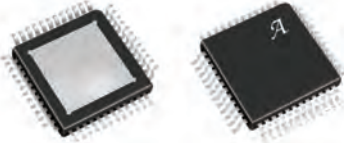
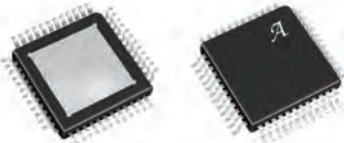
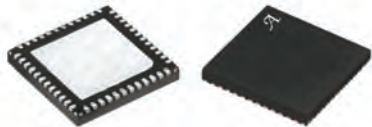
- Electronic power steering (EPS, EHPS, EAS)
- Pumps/fans/blower
- E-Turbo
- ISG (Integrated Starter Generator)
- Variable Valve Timing
- Power tools: drills, grinders, impact wrenches
- Lawn and garden equipment: lawn mowers, leaf blowers
- Household: robotic vacuums
- Pumps: Dish and clothes washer pumps

Brushless DC Drivers

Featured Products

Device	Features	Image
A5932 - Three Phase Sinusoidal Sensorless Fan Controller	5 V to 50 V operating voltage range - wide operating supply voltage range for variety of applications	
A5947 - Three-Phase Sensorless Fan Driver IC	Sinusoidal Drive Closed-Loop Speed Control EEPROM Programmability	
A4919 - Three Phase MOSFET Driver with Integrated Regulator	Integrated LDO for microprocessor supply	
AMT49413 - High Power BLDC MOSFET Controller with Integrated Hall Commutation	PWM control with TACH output, integrated current control	
A4910 - Automotive 3-Phase MOSFET Driver	Direct control with 3 independent current sense amplifiers	

Featured Safety Automotive Products

Device	Features	Image
A4918 - Automotive Three-Phase MOSFET Driver	Three current sense amplifiers, industry leading diagnostics	
A4916 - Automotive Three-Phase MOSFET Driver	Industry leading diagnostics	
AMT49105 - Highly Integrated ASIL BLDC MOSFET Driver IC	Integrated Lin Phy, LDO for micro-processor supply, watchdog, current sense amplifier and back emf comparators	



Really quiet. Easy to implement. Extremely efficient. Allegro’s QuietMotion family offers the first-to-market Field Oriented Control (FOC) brushless DC (BLDC) electric motor controllers that are customer code-free.

The devices are designed to provide reliable and efficient low audible noise performance while reducing design cycle time with simple parameter settings through an easy to use GUI.

Featured Products

Device	Features	Image
AMT49406 - Code-Free FOC Sensorless BLDC Motor Controller	<ul style="list-style-type: none"> - Zero reverse rotation - Low audible noise 	
A89301 - Ultra-Quiet, Code-Free, FOC Sensorless BLDC Motor Controller	<ul style="list-style-type: none"> - Optimized for low speed - Zero reverse rotation - Low audible noise 	
AMT49400 - Integrated Sensorless FOC BLDC Driver	<ul style="list-style-type: none"> - Low audible noise - Optimized for 12 V systems - 2 A Over Current Protections 	

Features

- Closed Loop Speed Control
- Automatic Phase Advance
- Non-Volatile EEPROM Configuration
- Low Audible Noise and Vibration
- Low Power Standby Mode
- Programmable PWM mapping
- Short Circuit Protection

Applications




- Small Appliance Blower and Air Purifier
- Suction Motor Robotic Vacuum
- Computer cooling
- Large Server Fan
- HVAC, Dehumidifier, and Air Purifier
- Drone Motor
- Upright Vacuum
- Water Pump

Brush DC Drivers

Brush DC motors are the most widely used drivers due to their low cost and simple drive control options. Typical brush DC motor drivers consist of a half bridge for a single direction operation and an H-bridge configuration for bidirectional control. PWM (Pulse Width Modulation) control can be used to regulate motor torque.

Allegro is a leading supplier of automotive electronic integrated circuits and is fully supportive of ISO 26262: Road Vehicles – Functional Safety. Auto makers worldwide require that electronic safety systems and their components are developed in compliance with this state-of-the-art standard.

Featured Products

Device	Features	Image
A3959 - DMOS Full-Bridge PWM Motor Driver	- 9.5 V to 50 V - 3 A - PH/EN Interface - Internal PWM, Sleep mode	
A5995 - DMOS Dual Full-Bridge PWM Motor Driver	- 8 V to 40 V – 3.2 A - SPI Interface or PH/EN - Internal PWM, Single Supply, OCP, Sleep mode, Fault Output	
A5957 - Full-Bridge PWM Gate Driver	- 4.5 V to 50 V – 1 kW Output - Direct Control - Fault, Reset	

Features

- Low standby current for energy efficiency
- Internal DMOS outputs or gate controllers to drive external MOSFETs
- Parallel interfaces with forward, reverse, coast, and brake modes
- Commercial grade and fully automotive qualified drivers
- Small footprint and reduced external components
- Strong protection and diagnostic features
- Integrated Current Sense
- Wettable Flank for Auto QFN
- ASIL compliant designs and processes to meet ISO 26262 requirements
- Three phase brush DC gate driver ICs with advanced diagnostics and verification features to support ASIL D safety goal compliance





Applications

- EPS
- Braking
- Pumps
- Integrated Starter Generator (ISG)
- EGR (Exhaust Gas Recirculation)
- HUD
- Active Shutter Vents
- Gate lift, sunroof
- Robotic vacuums
- Low voltage and Gaming electronics
- Vending and ticketing machines
- 3D printing
- POS Printers
- Solar shutters/blinds

Stepper Motor Drivers

Allegro MicroSystems offers a full line of stepper motor driver and pre-driver ICs. These devices feature easy to use two wire step and direction translator interfaces as well as industry standard parallel or serial control. Microstepping positioning is available with resolutions from full step to 32 microsteps per step. Microstepping results in increased step accuracy, and less resonance issues which results in lower audible noise. Safety features include thermal shutdown, undervoltage lockout and over current protection. Allegro offers a complete lineup of stepper motor drivers for automotive, industrial, consumer, and computer applications.

Featured Products

Device	Features	Image
AMT49700 - Automotive Stepper Driver IC with Programmable Motion Control	Peak motor current up to 1.6 A at 28 V	
A5984 - DMOS Microstepping Driver with Translator and Overcurrent Protection	Low current Sleep mode, <math>< 10 \mu\text{A}</math>	
A5988 - Quad DMOS Full-Bridge PWM Motor Driver	Peak motor current up to 1.6 A and 40 V	
A3916 - Dual DMOS Full-Bridge Motor Driver	2.7 V operation, single supply	

Features

- APFD Adaptive Percent Fast Decay
- Microstepping up to 32 microsteps per full step
- Diagnostic outputs for short circuit protection and stall detect assistance
- Protection features – Under-voltage lockout, thermal shutdown, shoot through, overvoltage, over current protection
- Internal DMOS outputs or gate controllers to drive external MOSFETs
- Fixed off-time PWM current control
- Accurate positioning and speed control without high cost external encoder feedback
- Slow, fast and mixed current decay options
- Synchronous rectification

Applications

- HVAC
- Heads Up Display
- Throttle Control
- Head Lamp leveling
- CCTV camera scan, tilt, focus control
- 3-D Printers
- Imaging systems – microscopes, industrial imaging
- Laser/dot matrix/inkjet/POS/Label
- Manufacturing industries – textile, robotic placement

ALLEGRO MICROSYSTEMS – A WORLDWIDE LEADER IN POWER AND SENSING SEMICONDUCTOR TECHNOLOGY

Inspired to innovate, Allegro is redefining the future of power and sensing semiconductor technologies. Our global engineering, manufacturing, and support, combined with our agility, make us a trusted partner to both large enterprises and regional market leaders.

From green energy to advanced mobility and motion control systems, Allegro's global team is passionate about developing intelligent solutions that give our customers a competitive edge and move technology – and the world – toward a safer and sustainable future.

ALLEGRO AT A GLANCE

30 YEARS
OF SEMICONDUCTOR
INNOVATION

OVER **400**
ACTIVE US PATENTS

OVER 10,000
CUSTOMERS
WORLDWIDE

#1 IN MARKET SHARE*
FOR MAGNETIC
SENSOR ICS

OVER **1 BILLION**
ICS SHIPPED
ANNUALLY

A TOP SUPPLIER**
OF AUTOMOTIVE
SENSOR ICS 🚗

* Source: IHS Markit, Technology Group, Magnetic Sensors Report - 2018. Information is not an endorsement of Allegro Microsystems. Any reliance on these results is at the third party's own risk. Visit www.technology.ihs.com for more details.

** Source: Strategy Analytics Automotive Semiconductor Vendor Shares 2018

Headquartered in Manchester, NH (USA), Allegro has design, applications, and sales support centers located across the Americas, Europe, Japan, and Asia. At Allegro, our investment in innovation helps our customers become more successful through the co-creation of technologies that differentiate their products.

To see how Allegro can bring your technology into the future, visit allegromicro.com.



SEE HOW ALLEGRO IS MOVING THE WORLD
TOWARD A SAFE AND SUSTAINABLE FUTURE



Learn more about Allegro Motor Control at
www.allegromicro.com

