

A CUT ABOVE THE REST

Driving Durability and Intelligence in Automated Lawn Care

Robotic lawnmowers have evolved from simple grass trimmers to sophisticated, autonomous groundskeepers. The next challenge lies in developing next-generation mowers that deliver a perfect cut, navigate complex yards, and operate safely and reliably in harsh outdoor conditions. This requires significant advancements in critical areas such as motor control, position sensing, and power management.

Position sensing is vital for safety functions like lift and bumper detection, motor commutation, and blade height adjustments. Magnetic sensing offers a contactless solution that is immune to dirt, grass, and water, ensuring reliable operation. Allegro offers a diverse line of rugged and efficient motor drivers for the cutting blades and wheels and power ICs to support these functions while addressing system-level concerns such as power efficiency, safety, and durability.

What you can achieve with Allegro solutions

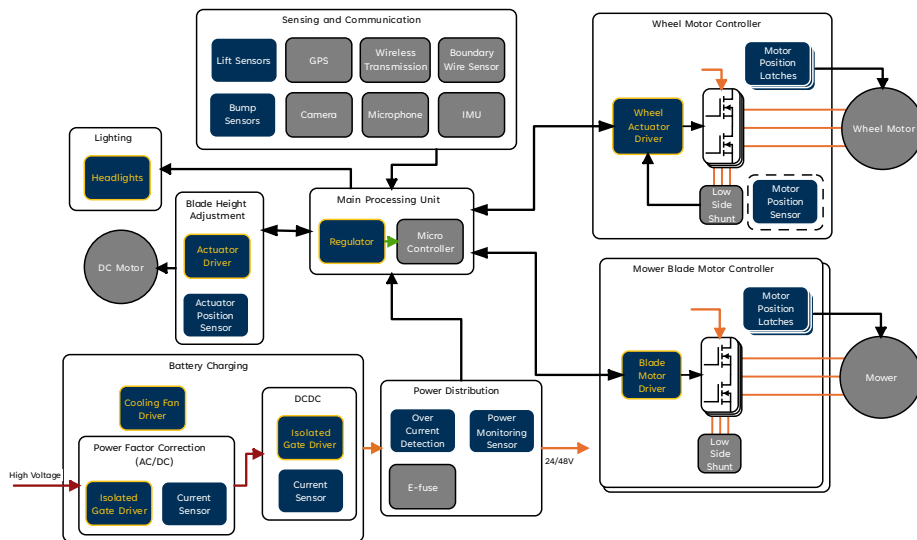
- **Enhanced Safety & Durability:** Allegro's robust Hall-effect latches, and position sensors provide contactless sensing for critical safety functions, ensuring reliable operation in outdoor environments with dirt, water, and vibration.
- **Longer Mowing Time:** Our high-efficiency motor drivers, isolated gate drivers for advanced power stages, and power monitoring current sensors optimize power consumption, extending battery life for maximum lawn coverage on a single charge.
- **Reduced System Cost:** Highly integrated solutions, including motor drivers with advanced control algorithms and sensors with wide airgap tolerances, reduce component count, simplify design, and lower overall manufacturing costs.



As robotic lawnmowers innovate to meet consumer demands for convenience and performance, the underlying technologies that power them become increasingly critical.

Allegro Microsystems' advanced magnetic sensors, motor drivers, and power ICs provide the precision, robustness, and reliability required for consistent performance in a demanding outdoor machine.

Block Diagram



Key Products and Solutions

Subsystem	Component	Allegro Parts	Key Differentiator
Lighting	Headlight Driver	A6211	Highly efficient, cost-effective solution
Sensing and Communication	Lift Sensor	APS12753	5V, wider airgap tolerance, efficient motor operation
	Bumper Sensor	A31015	User selectable sleep mode and quick wakeup
Wheel/Mower Blade Motor Controller	Wheel Actuator Driver	A89301	3-Phase BLDC Motor Pre-Driver with Hall commutation
	Blade Motor Driver		
	Motor Position Latches	APS12203	24V, wider airgap tolerance, efficient motor operation
	Motor Position Sensor	A1339	Precision angle sensor with integrated diagnostics
Power Distribution	Over Current Detection	CT4022	Isolated, 500kHz, ultra-low noise TMR current sensor
	Power Monitoring Sensor	ACS37800	Isolated, programmable power monitoring IC
Battery Charging	Isolated Gate Driver	AHV85311	Simplified design, reduced BOM, optimized for SiC FETs
	Current Sensor	CT433	High bandwidth and low noise
	Cooling Fan Driver	A5931/2	Sensorless sinusoidal BLDC fan driver in 4x4mm package
Blade Height Adjustment	Actuator Driver (DC)	A89500	48V Half-Bridge Driver (100V max), small form factor
	Actuator Position Sensor	A31015	User selectable sleep mode and quick wakeup
Main Processing Unit	Regulator	APM81815	48V, 4x4x2mm package with integrated components



To learn more about the Allegro family of products and to explore available design resources, visit allegromicro.com