

A SCALABLE APPROACH TO POWER TOOL DESIGN

Components That Enable A Single-Platform Design

Achieve all of your design goals for voltage and power levels with a single-platform architecture by combining Allegro drivers, sensors, and regulators.

Powerful and efficient electric power and garden tools are now commonplace within the construction and home-improvement segment. Battery-powered tools continue to gain preference with users due to their convenience and performance that's comparable to their corded and gas-powered predecessors.

Reliability, maximum torque, high efficiency, lightweight, and small size are the features that elevate good tools to great tools. Designers must consider how requirements change to match the use case of the specific tool or equipment. For example, a 48 V electric lawn mower has different start/stop conditions, control schemes, and torque demands than an 18 V hammer drill.

The easy-to-use sense and drive products from Allegro allow you to get your design up and running faster while supporting a wide range of power levels and architectures.

Features and Benefits

- Wide voltage input ranges support 12 V to > 56 V platforms for **higher efficiency and design reuse.**
- Robust, accurate sensors take the guesswork out of motor control to **improve power delivery, efficiency, and run-time.**
- Compact packages and footprints **reduce board space and enable smaller designs.**
- Industry-leading transient protection **increases the reliability and longevity of the tool.**
- Powerful gate drive strength helps to deliver power more quickly for **higher torque and efficiency.**

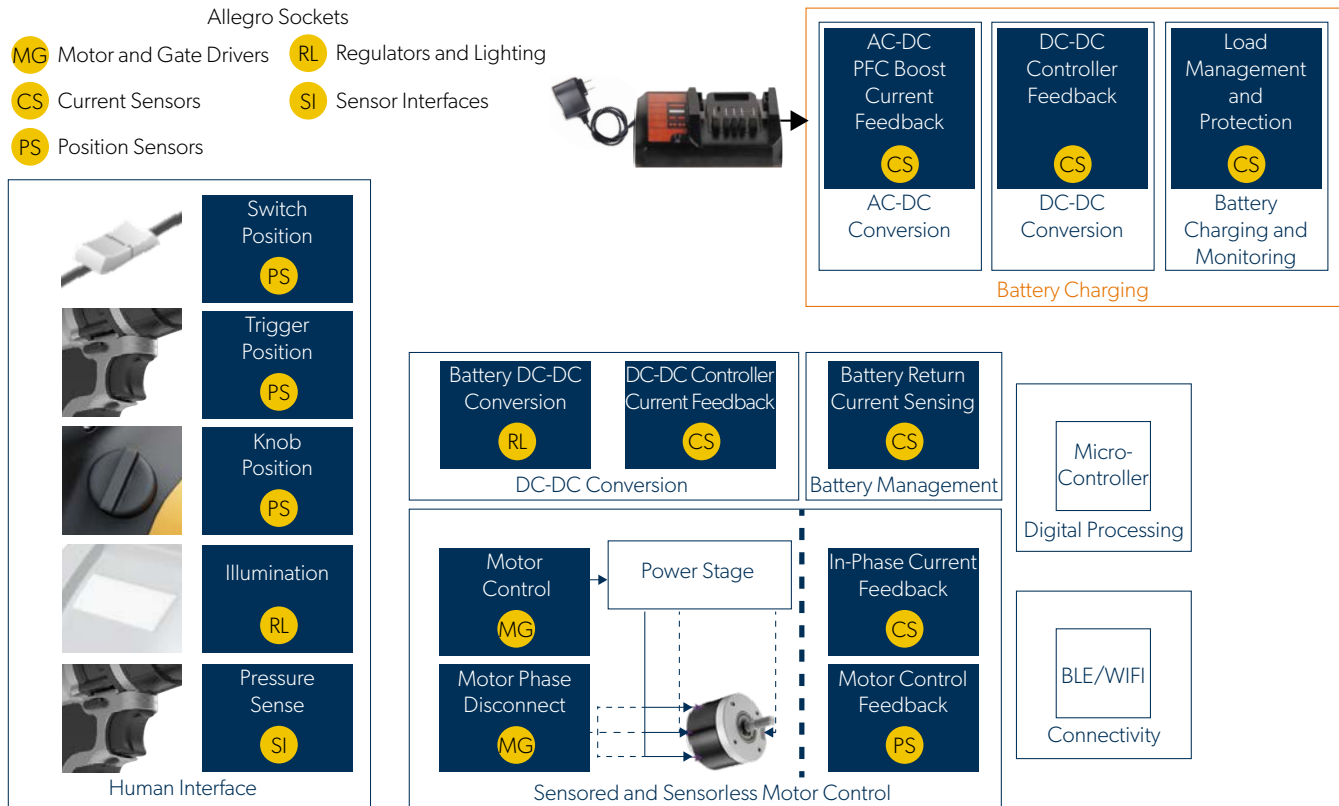
Our flexible sensors, regulators, and drivers enable reuse across a range of system voltages and torque demands. These easy-to-use products help customers meet evolving requirements with innovative features and small package sizes to help manufacturers reduce costs and shrink bills of materials (BOMs) and form factors.



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| <p>1 Battery Management</p> <ul style="list-style-type: none"> • Current Sensor • Step-Down Regulator | <p>2 Motor Control</p> <ul style="list-style-type: none"> • 3-Phase Driver • Half-Bridge Driver |
| <p>3 Motor Feedback</p> <ul style="list-style-type: none"> • Current Sensor • Position Sensor | <p>4 Input Detection</p> <ul style="list-style-type: none"> • Trigger/Lever Sensor • Switch/Interlock Detection |
| <p>5 Illumination</p> <ul style="list-style-type: none"> • Workspace Light | <p>6 Propulsion</p> <ul style="list-style-type: none"> • 3-Phase Driver • Position Sensor |

Market-Leading Portfolios That Sense, Regulate, and Drive

Simple Block Diagram for Power and Garden Tools



Key Products and Features for Power Tools and Garden Tools

Function	Component	Allegro Part	Key Differentiator
Motor Controller	GDU + Controller	AMT49413	Combined gate driver unit and controller with protections and diagnostics simplify design
	Gate Drive Unit	A4919	Gate driver with integrated low dropout eliminates need for external voltage supply
		A89500	100 V rating to support wide-voltage platforms with a single part
Motor Feedback	Current Sensor	ACS724	High rejection of fast voltage transients for improved control during start and stop
		ACS71240	All-in-one current and overcurrent sensor reduces space and components
	Hall Latch	APS13290	High speed and short power-on time enable improved control and higher efficiency
Battery Charging and Regulation	Current Sensor	ACS711	All-in-one current and overcurrent sensor in cost-optimized 3 × 3 mm QFN
	Regulator	A81805	Low output error helps maintain system stability and analog-to-digital convertor accuracy
Input Detection	Switch/Interlock	A1120	Higher reliability over delicate microswitches to extend tool's operating life
	Trigger Sensor	A1393	Noncontact for longer tool life while < 1 μA sleep current extends standby modes
Safety Mechanisms	Disconnect Driver	A6862	4-channel control of phase and battery disconnect for the highest safety
	High Side Sensor	ACS711	All-in-one current and overcurrent sensor in cost-optimized 3 × 3 mm QFN

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

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