



INNOVATION WITH PURPOSE

ALLEGRO
microsystems

xEV THERMAL MANAGEMENT SYSTEM

Increased Efficiency, Flexible and Scalable,
Low Noise and Precise Control

The current global transition towards electric vehicles (EVs) accentuates the necessity of optimizing the numerous subsystems these vehicles rely on. Among these critical components is the thermal management system (TMS), which is responsible for upholding optimal operating temperatures for key EV elements—the battery, power electronics, and the electric motor, as well as the cabin.

The prevailing requirements and evolving trends within TMS pose several challenges to power IC and sensor suppliers, including power density, efficiency and accuracy, wide bandwidth, high power management, integration and miniaturization.

Allegro provides holistic solutions that enable more flexible and scalable EV TMS with low noise and precise control, thus improving energy efficiency.



PTC Heater



Traction Motor Cooling



Valve Control



HV Battery Cooling



Flap Control



Fan Control



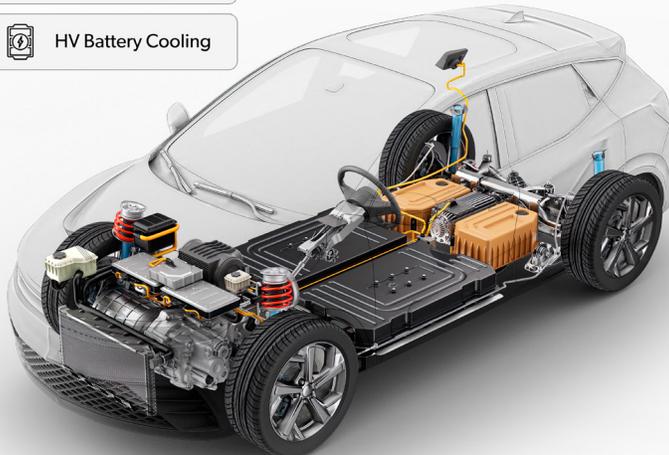
Pump Control



48V/12V e-Compressor



HV e-Compressor



Allegro solutions provide:

Efficiency

- Code-free, sensorless motor drivers simplify design and eliminate uC and software development.
- Current sensors offer low resistance and galvanic isolation.
- HV gate drivers in e-compressors improve temperature control and design.

Flexible and Scalable

- Fans and pumps are optimized by fully programmable SoC sensorless motor driver.
- Isolated gate drivers reduce footprint, PCB area, and overall costs.

Low Noise and Precise Control

- QuietMotion motor drivers minimize noise during start-up and simplify motor control.
- Highly accurate position feedback guarantees efficient heat exchange and precise temperature control.

Magnetic Sensor ICs

Switches & Latches
Position Sensors
Current Sensors
Speed Sensors

Power ICs

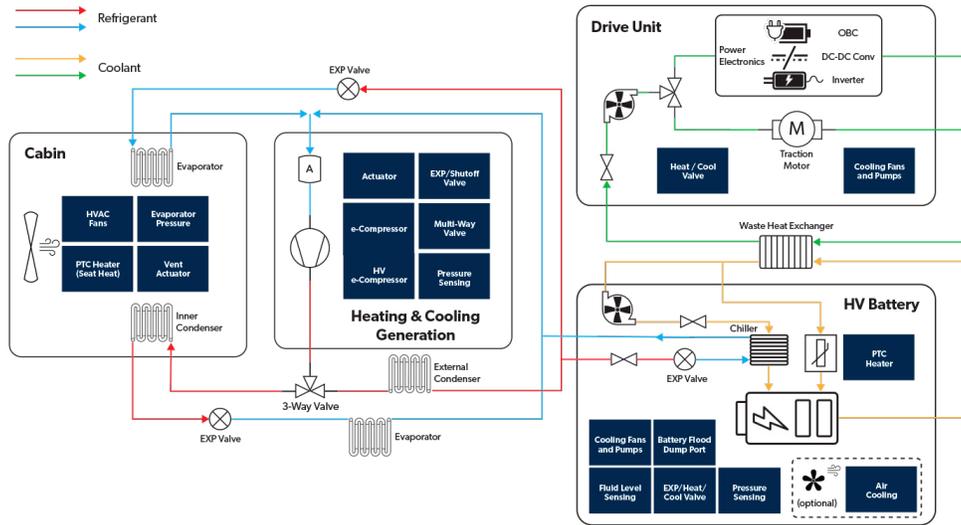
Motor Drivers
Isolated Gate Drivers
Non-Isolated Gate Drivers
DC-DC Regulators
LED Drivers



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

Market-Leading Portfolios That Sense, Regulate, and Drive

Block Diagram



Features and Benefits

Subsystem	Component	Key Differentiator	Allegro Part
Heating & Cooling Generation (e-Compressor)	HV Gate Driver	World's first and only Isolated E-Mode GaN Driver in Small Footprint	AHV85110
	HV Current Feedback	High Accurate 400KHz Current Sensor with Overcurrent Detection	ACS37002
	48V Gate Driver	80V Three-Phase MOSFET Driver with Internal uC Supply	AMT49101
	48V Current Feedback	Coming soon The closest replacement part is ACS72981	ACS37220*
	Position Sensing	Coming soon The closest replacement part is AAS33001	A17802/3*
Cabin Comfort	PTC Heater Driver	80V Half-Bridge MOSFET Driver with ASIL Compliance	A89503
	PTC Heater Regulator	3A Synchronous Buck Module, Low noise and 6 μA Quiescent Current	APM81803
	HVAC Fan Driver	Sensorless FOC Motor Driver Ultra-low Noise and Vibration Courtesy	A89307
	Vent Actuator	Stepper Driver IC with Programmable Motion Control	AMT49700
Brushed DC Motor Stepper Motor	Pump Driver	Coming Soon The closest replacement part is A89307	A89201*
	Air Cooling Fan Driver	Sensorless BLDC Gate Driver with Low Noise for High Power Fans	A5932
	Valve Control Driver	PWM Control of DC Motor, Peak Output Current up to ±3 A with OCP	A5950
	Pressure Interface	On-chip Poly(4,4) Compensation, High Accuracy over Temp.	A17700

*Not Released, in Development



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