

Backup Power for the Age of Compute

Uptime and Telemetry for the Next Generation of AI Infrastructure

Rising power demands from AI inference and training are driving adoption of in-rack battery backup units (BBUs). BBUs provide seconds to minutes of power until longer duration power comes online. Distributed BBUs limit a failure's blast radius.

Battery back up units rely on magnetic current sensors, isolated gate drivers, and fan drivers to monitor, convert, and safely deliver backup power when the grid fails. Allegro's robust portfolio of integrated current and field sensors delivers high accuracy and ultra-fast response times across the charger, discharger, and bus total output current. Complementing these sensors, PowerThru™ isolated gate drivers ensure efficient switching with superior EMI performance and increased power density, while dedicated fan drivers provide critical thermal management to keep the control board running reliably.

What you can achieve with Allegro solutions

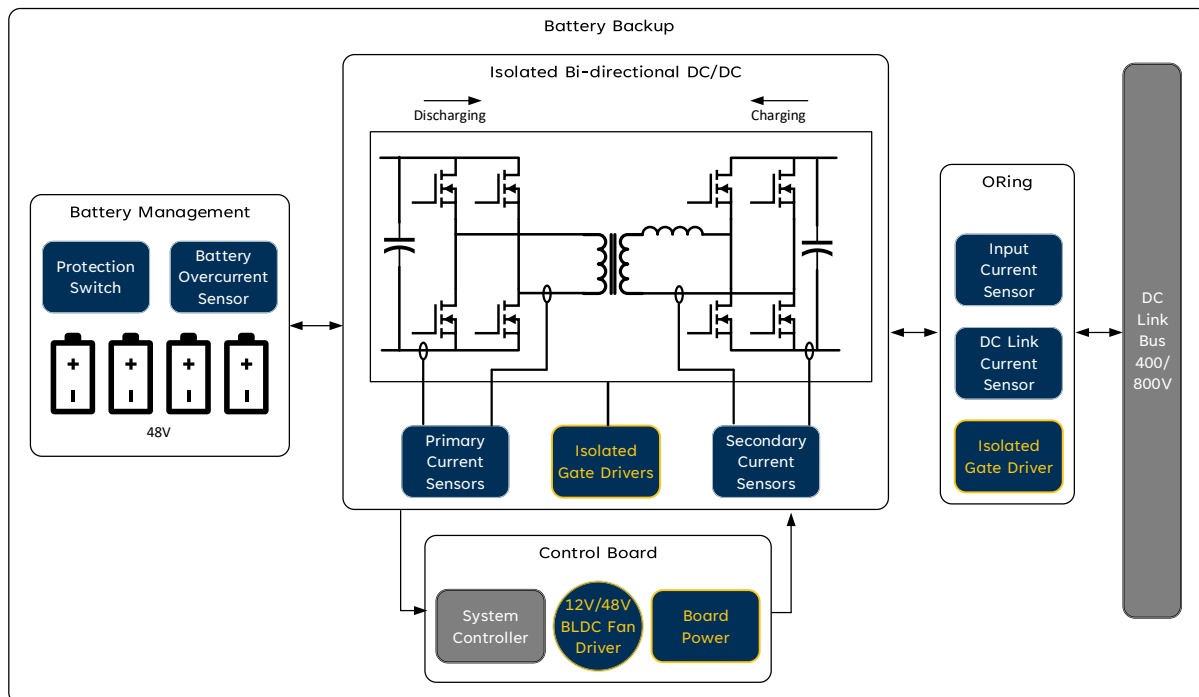
- **Reliable System Telemetry:** Magnetic current sensors meet the strict accuracy and less than 1µs response time required for critical overcurrent protection and power handoffs in case of grid failure.
- **Streamlined Power Conversion:** Built to support a wide range of BBU architectures, our isolated gate drivers eliminate bulky transformers thereby providing a highly integrated solution needed to drive SiC FETs.
- **Comprehensive Protection & Thermal Management:** Maximize BBU lifespan with fast-acting battery protection switches that guard against critical faults and 12V/48V BLDC fan drivers that keep the control board at optimal temperature under heavy loads.



Hyperscalers increasingly rely on BBU integrated sidecars to protect high value AI infrastructure, ensuring that expensive training and inference hardware is safeguarded against costly downtime.

Allegro Microsystems' range of magnetic current sensors, isolated gate drivers, and motor drivers enable the fast-acting protection and thermal management needed to maximize BBU uptime and lifespan.

Block Diagram



Key Products and Solutions

Subsystem	Component	Allegro Parts	Key Differentiator
Iso Bi-directional DC/DC	Charge Current Sense	ACS37002	±1% max sensitivity error over temperature and 1 microsecond response time for OCF fault in MA package with reinforced isolation
Iso Bi-directional DC/DC	Discharger Current Sense	ACS37030	DC to 5 MHz bandwidth with ultra-fast (40 ns) response time in MY package
		ACS37002	400 kHz bandwidth with low internal primary conductor resistance (0.27 mΩ)
Bus Output	Output Current Sense	ACS37002	±1.5% sensitivity over temp with 1 microsecond typical response time in 16 pin MC package
	Output Current Sense	ACS37610	Coreless sensor with sensing range from 100 A to >4000 A with ±1% sensitivity
Battery Management	Protection Switch	A89500	Half bridge driver with operation up to 100V bridge supply with bootstrap gate drive
	Battery Overcurrent Sense	ACS37002	±1% max sensitivity error over temperature and 1 microsecond response time for OCF fault in MA package with reinforced isolation
Oring	Input Current Sense	ACS37030	DC to 5 MHz bandwidth with ultra-fast (40 ns) response time in available 6 pin LZ or 6 pin wide body MY package
	DC Link Current Sense	ACS37800	Accurate measurements for active, reactive, apparent power and power factor
	Isolated Gate Drive	AHV85311	Integrated isolated bias supply with miller clamp and delivering 130 nC gate charge at 25V
Control Board	12V/48V BLDC Fan Drive	A89333	48V code free FOC enabled motor controller in a 3 phase sensorless configuration
	Board Power	APM81815	80 V, 1.5 A synchronous buck regulator with 28 µA quiescent current



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