

REVOLUTIONIZING URBAN AIR MOBILITY

Driving Efficiency, Safety, and Reliability in eVTOLs

Electric Vertical Take-Off and Landing (eVTOL) aircrafts are transforming transportation with quiet, zero-emission urban mobility. These advanced aircrafts require high-performance electronics to manage propulsion, battery systems, and flight controls safely and efficiently. This transformation is being accelerated by the urgent global demand for decarbonization, which is driving rapid innovation in both electric aviation and autonomous flight technologies.

Designers face the critical challenge of balancing Size, Weight, and Power (SWaP) to maximize payload and range. High-voltage propulsion systems require efficient switching to minimize heat and energy loss, while battery management systems demand extreme precision to monitor state-of-charge. Additionally, flight control systems must operate reliably in harsh electromagnetic environments. This necessitates compact, lightweight components that offer immunity to interference and built-in diagnostics to ensure safe operation during every phase of flight.



What you can achieve with Allegro solutions

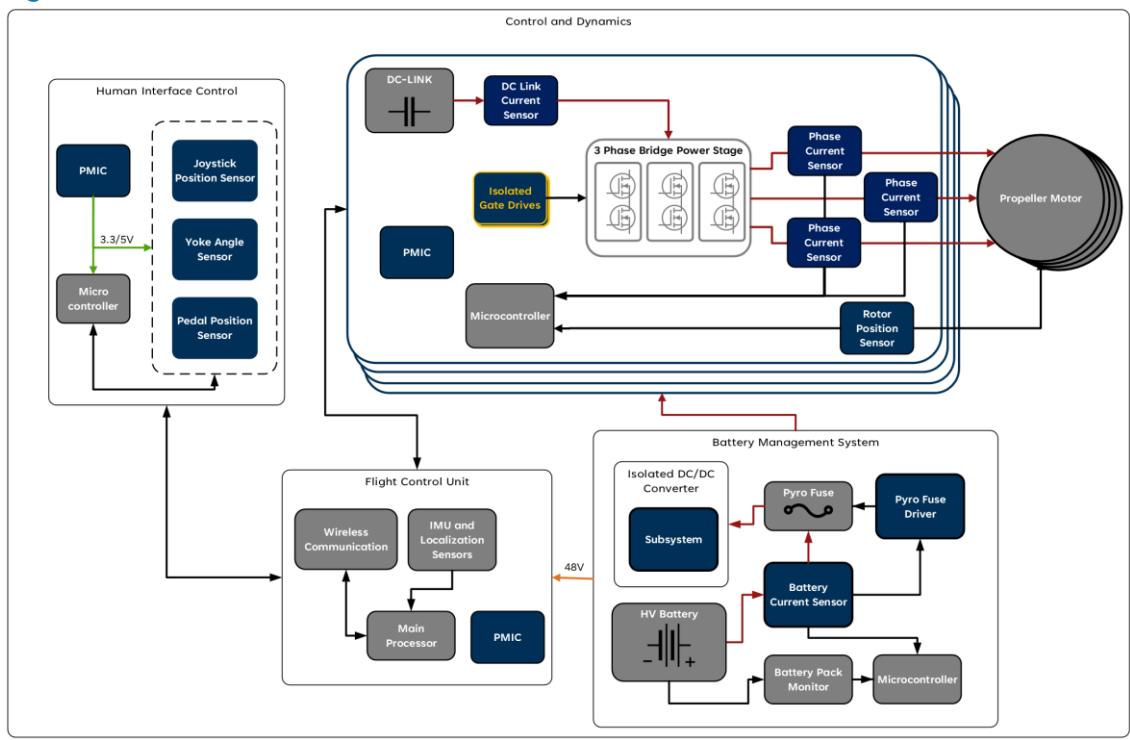
- **Maximize Flight Range & Payload:** High-efficiency SiC/GaN isolated gate drivers and ultra-low resistance current sensors reduce power losses and eliminate heavy components. This optimization of power density and weight directly contributes to longer flight times and increased payload capacity.
- **Enhanced Safety & Reliability:** Robust Hall-effect, TMR, and inductive position sensors feature stray field immunity and ISO 26262 compliance ensure precise, reliable control for safety-critical systems even in noisy magnetic environments.
- **Simplified Design & Reduced Cost:** Highly integrated gate drivers with internal bias supplies and compact PMICs, significantly reduce the BOM and PCB footprint. This simplifies the design process and lowers manufacturing costs without compromising performance.



The urgent demand for sustainable urban transport and decarbonization is driving rapid innovation in electric aviation and autonomous flight technologies.

Allegro's market-leading magnetic sensors and power ICs reduce system weight and boost efficiency, directly extending flight range. Our robust, automotive-grade solutions ensure the functional safety and reliability required for critical aerospace applications.

Block Diagram



Key Products and Solutions

Subsystem	Component	Allegro Parts	Key Differentiator
Servo Motor Controller	DC Link Current Sensor	ACS37612	Coreless sensing with fast response time
	In-Phase Current Sensor	ACS37220	Ultra high-power density
	Rotor Position Sensor	A33023	ISO 26262 compliant with stray field immunity
		A17802	Zero effective propagation delay and stray field immunity
	Isolated Gate Driver	AHV85111	Eliminates isolated supplies via Power-Thru™ technology and reduces BOM and footprint
		AHV85311	
Battery Management System	Battery Current Sensor	ACS37610	Measures >1000 A without saturation or hysteresis
	Pyro Fuse Driver	A3942/4	Robust gate driver with SPI control and diagnostics
Human Interface Control	Joystick	A31301	Flexible 3D sensing for on-axis or off-axis designs
	Valve Angle Sensor	A33023	High-precision linearization with stray field immunity
	Pedal Position Sensor	A31315	3D stray-field immune sensing for complex movements
Power Supply	DC/DC Converter	APM81815	Integrated passives deliver lowest external component count



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