

Shifting the future of electric vehicles

GHSP's longstanding partnership with Allegro MicroSystems elevates the eVibe product



As electric vehicles grew in popularity, drivers began noticing something was missing: a connection to the vehicle they were driving. The quiet, calm experience behind the wheel was at times disconnected to what was happening outside the car and under the hood. This lack of responsiveness translated to both a safety risk and a lackluster driving experience.

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—Dan Dawiedczyk, president of GHSP

To fill this void, GHSP designed eVibe, a product that mimics the vibration and sound of a combustion engine, infusing more safety and excitement into the experience of driving an electric vehicle.

"There's a coolness factor to getting your in car, hitting the gas and hearing that rev," says Dan Dawiedczyk, president of GHSP. "There's a lot of expertise that goes into these products. We simply would not have been able to develop this product without the innovation, collaboration, and automotive grade excellence from our partner Allegro MicroSystems."

Driving innovation

The technology used in eVibe's system started out as antivibration control for gas-powered vehicles. But as the market for personal vehicles began to shift toward electric, GHSP redirected its efforts. Instead of a component that cancels out vibrations, they developed a compact system that generates vibrations on a vehicle's chassis.

The vibrations that eVibe recreates are the sensations of idling, throttling, and shifting into high-speed gears—and it can all be adjusted to meet each driver's preference through automotive vibration controls. The result is a driving experience that is exciting, immersive, and safer. Because drivers have more haptic feedback from the vehicle—and because the eVibe product can simulate rumble strips and other safety warnings—drivers are more aware and connected to their vehicle.

But while developing the product, GHSP encountered some challenges. They needed a motor controller that could support the product's complex algorithm—something that could operate at high speeds but also allow for precise control. They also needed a Hall latch with low jitter and fast output response.

So, they turned to Allegro MicroSystems, a trusted partner for more than 20 years. Allegro, which has decades of experience developing advanced semiconductor technology, is a global leader in power and sensing solutions for motion control and energy-efficient systems. Working closely to meet GHSP's needs, Allegro designed these system-level innovations.

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"Allegro's expertise helped shape the minute details that allow the eVibe product to achieve this incredible experiential feat," says Larry Ridge, Chief Engineer at GHSP. "We're changing the relationship that drivers have with their electric vehicles, and that will have a huge impact on the industry."

Finding the right gear

The Allegro components used in eVibe's system are simple and adaptable, yet have exceptional power density and are built to withstand harsh environments. These features contribute to the components' best-in-class performance and enable precise motor control that are necessary for eVibe to be successful.

"Allegro's technologies were a perfect fit and strengthened our end product," says Brad Sanderson, systems engineer at GHSP. "When we work with Allegro, we know we're going to get exactly what we need at the highest quality."

The motor driver used in the eVibe product, Allegro's Fast Switching 100 V Half-Bridge MOSFET Driver ([A89500](#)), is a strong gate driver that allows for high power density and low latency switching. With its unmatched transient robustness and an input voltage that's among the widest on the market, Allegro's motor driver outperforms many of its competing solutions. Additionally, its simple interface makes it easy to design into products, improving GHSP's time to market.

GHSP chose Allegro's High-Temperature Hall-Effect Latch for Low Voltage Applications ([APS12215](#)) in part for its unrivaled high temperature performance. Plus, its stable

switching capabilities allow for precise motor control. By enabling the software to precisely track and monitor the position of the motors' unbalanced weights, the latch allows eVibe to emulate vibration and quickly change speeds. All these features are market differentiators that make Allegro a valuable partner for GHSP.

In fact, GHSP has come to rely on Allegro for several of its technologies and system solutions over the years. For example, GHSP uses Allegro's analog motor drivers—comprehensive systems that allow motor pumps to safely operate in harsh conditions—in many of its flagship products, including oil and coolant pumps. These reliable and efficient motor drivers stand out for their wide voltage input range, best-in-class gate drive protections, enhanced diagnostics, high integration, and small footprint.

// They deliver on technology that doesn't fail. —Dan Dawiedczyk

"They deliver on technology that doesn't fail," Dawiedczyk says. "Partnering with Allegro helps us excel. Their on-site support helps us overcome challenges quickly, their consistent supply chain limits disruptions, and they believe in collaboration which pushes our business—and the industry—forward."

Defining the road ahead

The eVibe product is the latest in a long list of leading innovations born from the collaboration between GHSP and Allegro MicroSystems. Each time the two companies come together to solve a problem or meet a need, the result is often a new feature or capability that propels the industry forward.

"The world of automotive design is complex and competitive, so having solid partners like Allegro is critical to moving forward," Dawiedczyk says. "In so many ways, Allegro is a multiplier. I have no doubt that together, we'll continue to push the boundaries of what is possible for years to come."