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Three-Phase BLDC Motor Driver Reduces Solution Size

Qorvo's ACT72350 160-V, three-phase gate driver is said to enable a smaller solution size while dramatically reducing design time and bill of materials (BOM) cost and component count versus a discrete design in automotive and industrial motor control. The IC replaces as many as 40 discrete components in a BLDC motor control system and offers a configurable AFE, enabling customers to configure their exact sensing and position detection requirements (Figs. 1 and 2).

The ACT72350 also includes a configurable power manager with an internal buck converter and LDOs to support internal components and serve as an optional supply for the host MCU device. The gate driver's wide 25-V to 160-V input range also allows customers to reuse the same design for a variety of battery-operated motor control applications including power and garden tools, drones, EVs and e-bikes.

Jeff Strang, Qorvo Power Management GM, said, "The newest addition to our power management portfolio brings added flexibility to our customers' BLDC designs, significantly reducing total solution size, design time and BOM cost. The ACT72350 provides the critical analog circuitry needed to implement a BLDC motor control system and can be paired with a variety of popular MCUs."

The ACT72350 delivers high efficiency through programable propagation delay, precise current sensing and BEMF feedback, and differentiated features for safety-critical applications. This robust, SOI-based motor driver is available now in a 9.0-mm x 9.0-mm, 57-pin QFN package. For more information, see the ACT72350 page. In addition, an evaluation kit is available here on qorvo.com and a model of the ACT72350 is available in Qorvo's QSPICE circuit simulation software on the QSPICE Simulator page.

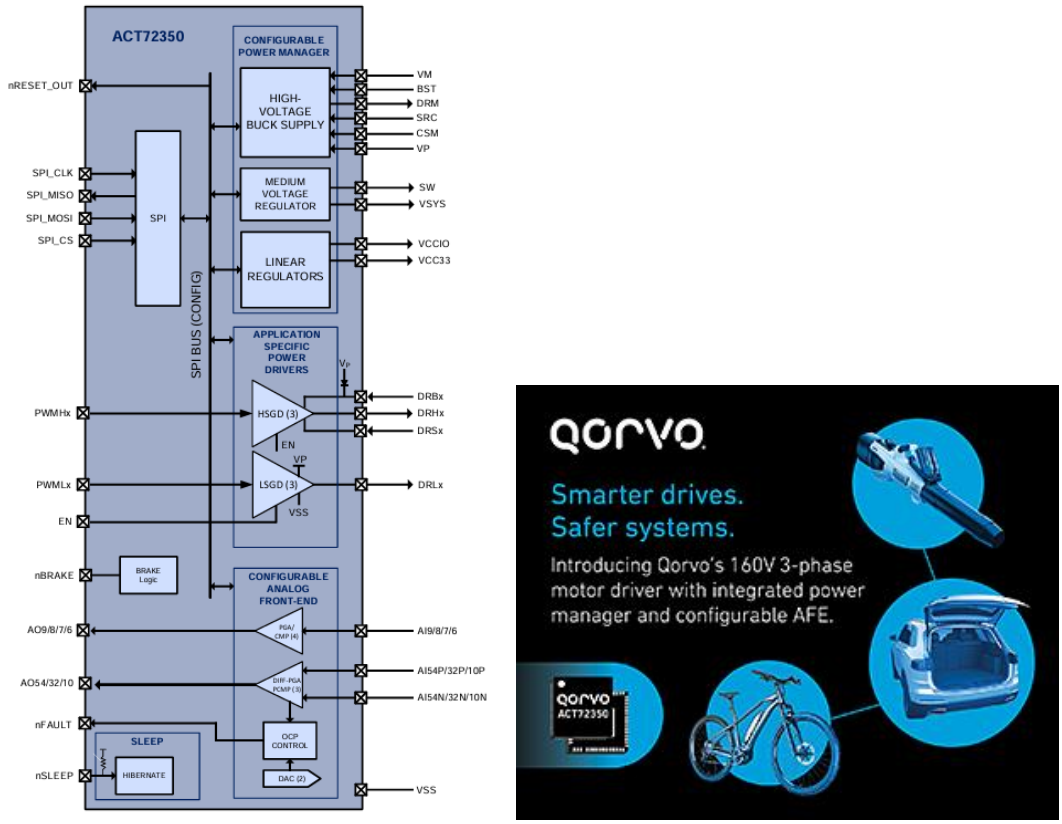

Fig. 1. The ACT72350 is a standalone three-phase BLDC motor driver with an analog front end (AFE) that allows customers to drive up to 20 S battery power with a 160-V rating. The AFE powers the system MCU while delivering up to 2-A source or -2-A sink drive capability. A simplified block diagram is shown in (a) while the PR photo on the right (b) shows the package and example applications.

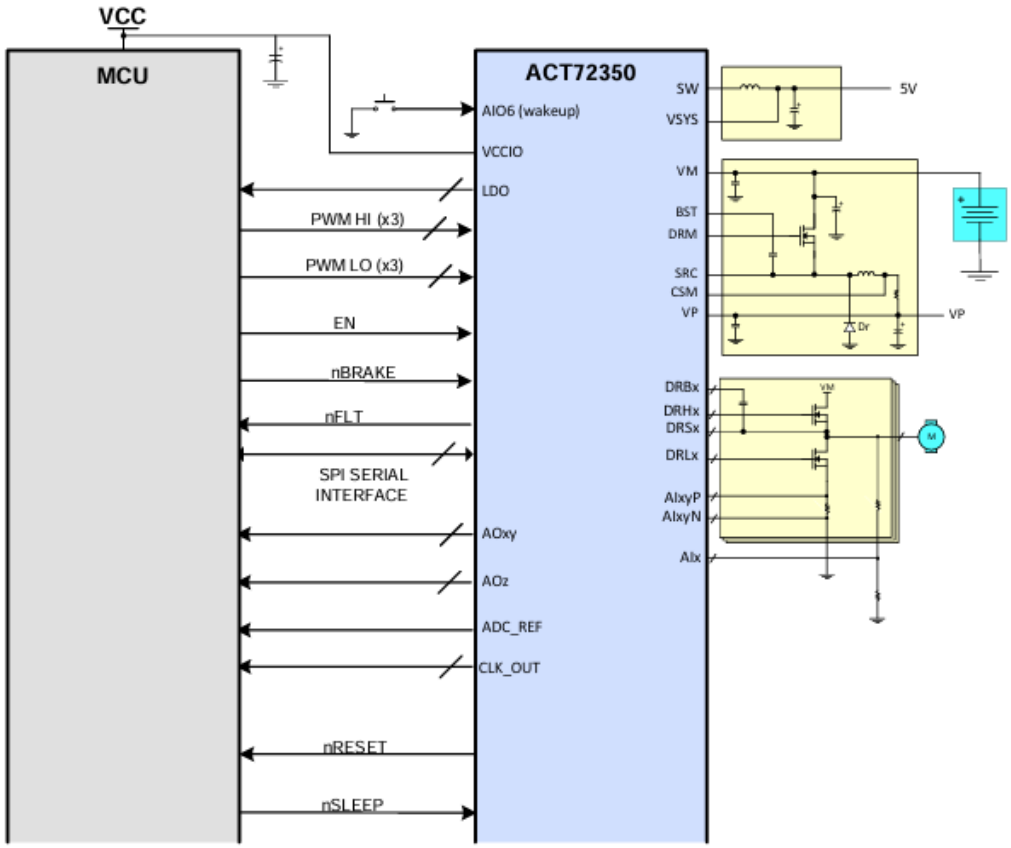

Fig. 2. Typical application diagram. The overall BOM for a motor control design is reduced significantly through integrated bootstrap diodes, and integration of all analog blocks needed to measure current and protect the device. This device uses Qorvo's patent-pending Multi-Mode Power Manager, Configurable Analog Front End, and Application Specific Power Drivers and also contains a robust braking feature for safety critical applications.