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Integrated Power Application Controllers® (PAC™) for Brushless DC and Permanent Magnet Synchronous Motors

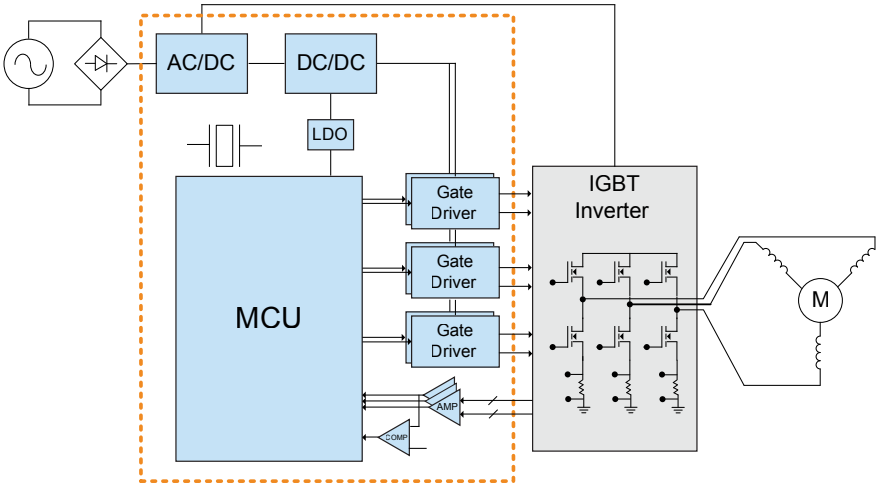
Compact system-on-chip devices in a single IC for AC-powered applications

all around you

Maximize Space and Power in High-Voltage White Goods

As consumers demand more power- and space-efficient home appliances, designers are turning to Power Application Controllers (PAC) from Qorvo® to achieve those goals. Qorvo's PAC family of products are fully-optimized, highly integrated system-on-chip devices with a programmable motor controller and driver in a single IC, enabling highly efficient and compact solutions which help meet efficiency and ENERGY STAR® requirements.

Qorvo offers the most compact solutions for brushless DC (BLDC) and permanent magnet synchronous motors (PMSM) with AC supply, with the lowest standby current of any integrated solution. The company has the only integrated 600 V IC with a FLASH-based MCU, 600 V gate drivers, 600 V DC/DC and signal conditioning into one small QFN package.



This diagram illustrates the compact efficiency of a single IC.

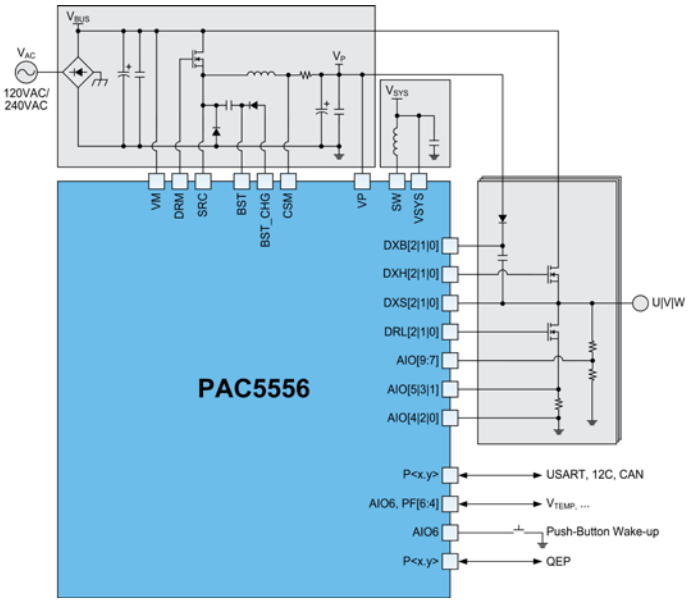
By combining these features in a single IC, Qorvo enables the smallest footprint, reduces bill of material and lowers costs. These PAC solutions are powering some of the world's largest white goods brands.

PAC Application Solutions

The PAC5xxx portfolio offers the most efficient, microcontroller-based motor controllers on the market, suitable for home appliances, power tools, garden tools, industrial automation, medical equipment, drones and remote-control vehicles and other applications. As part of Qorvo's complete range of battery- and AC-powered motor control and drive solutions, the PAC5xxx family also enables IoT connected devices when coupled with Qorvo's low-power, wireless **Bluetooth**® Low Energy solutions.

Key features include:

- High integration that enables small size, low cost and high-performance drive
- Integrated 50 MHz Arm® Cortex®-M0 or 150 MHz Arm® Cortex®-M4F MCUs
- Integrated, configurable power management up to 600 V supply input; support for flyback and buck topologies
- Integrated high-side and low-side gate drivers
- Ultra-low standby power consumption of 8 µA
- Flexible and configurable power and temperature monitoring to build a more reliable motor drive control system
- Integrated 3 differential and 4 single-ended programmable-gain amplifiers (PGAs) for voltage and current sensing



This system block diagram illustrates the very high degree of integration in the Qorvo PAC5556, which supports high-voltage applications.

White Goods/Compressor, Fans, AC Power Tools

Qorvo high-voltage PAC family of ICs for offline AC-powered equipment and power tools

Part Number	Package (mm)	MCU	IO	Power Management	Gate Drivers	Signal Conditioning	Applications
PAC5250	10x10 57L	50 MHz Arm® Cortex®-M0 32 kB FLASH, 8 kB SRAM 10b 1 MSPS ADC UART/SPI, I2C	2 @ 3.3 V 13 @ 3.3 V/5 V 10 @ 5 V	600 V Flyback DC/DC Core, IO, Analog LDOs	3 HS: 600 V@ 0.5/0.25A 3 LS:1A	3 Diff PGA 4 Single PGA	White Goods, AC Fans, AC Compressors, AC Power Tools
PAC5253	8x8 43L	50 MHz Arm® Cortex®-M0 32 kB FLASH, 8 kB SRAM 10b 1 MSPS ADC UART/SPI, I2C	1 @ 3.3 V 9 @ 3.3 V/5 V 10 @ 5 V	600 V Flyback DC/DC Core, IO, Analog LDOs	3 HS: 600 V @ 0.5/0.25A 3 LS: 1A	3 Diff PGA 4 Single PGA	White Goods, AC Fans, AC Compressors, AC Power Tools
PAC5255	10x10 57L	50 MHz Arm® Cortex®-M0 32 kB FLASH, 8 kB SRAM 10b 1 MSPS ADC UART/SPI, I2C	2 @ 3.3 V 13 @ 3.3 V/5 V 10 @ 5 V	600 V Flyback DC/DC Core, IO, Analog LDOs	3 HS: 600 V @ 0.5/0.25A 3 LS: 1A	3 Diff PGA 4 SIngle PGA	White Goods, AC Fans, AC Compressors, AC Power Tools
PAC5256	10x10 52L	50 MHz Arm® Cortex®-M0 32 kB FLASH, 8 kB SRAM 10b 1 MSPS ADC UART/SPI, I2C	5 @ 3.3 V 12 @ 3.3 V/5 V 10 @ 5 V	600 V Buck DC/DC Core, IO, Analog LDOs	3 HS: 600 V @ 0.5/0.25A 3 LS: 1A	3 Diff PGA 4 SIngle PGA	White Goods, AC Fans, AC Compressors, AC Power Tools
PAC5556	10x10 52L	150 MHz Arm® Cortex®-M4F 128 kB FLASH, 32 kB SRAM 12b 1 MSPS ADC 3xUSART, CAN, I2C, QEP	13 @ 3.3 V 10 @ 5 V	600 V Buck DC/DC Core, IO, Analog LDOs	3 HS: 600 V @ 0.5/0.25A 3 LS: 1A	3 Diff PGA 4 Single PGA	High-Performance White Foods

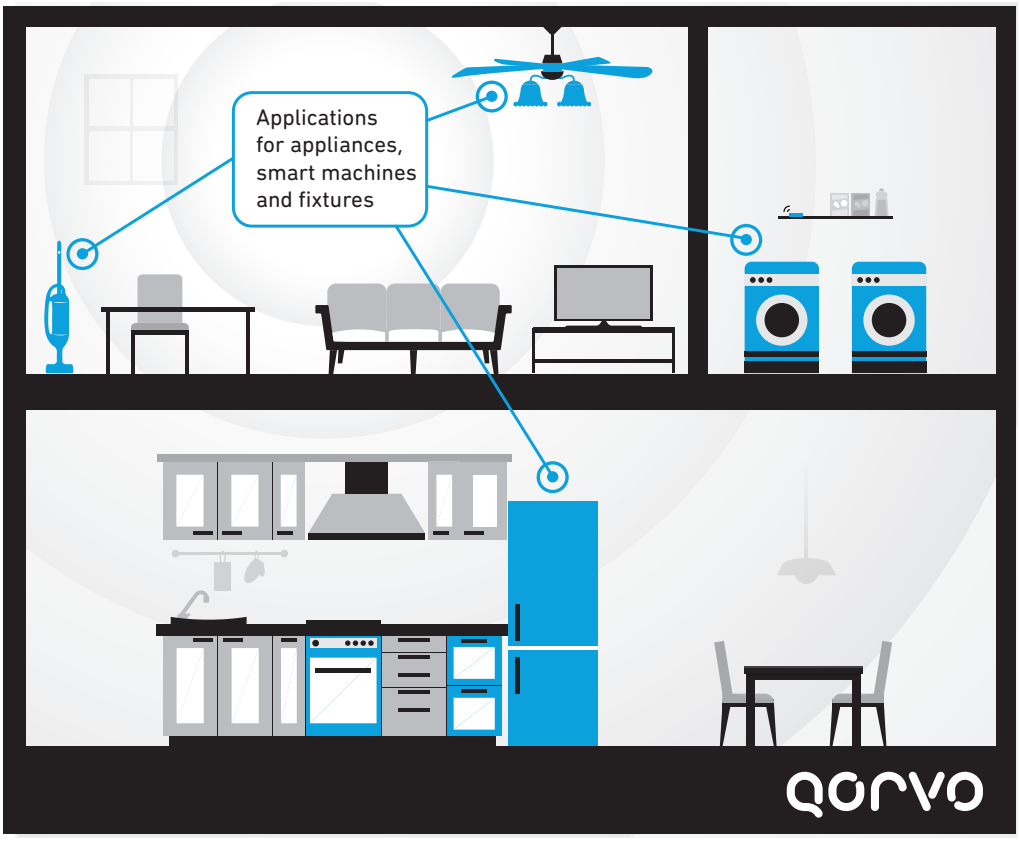
Lower Costs and Faster Time-to-Market

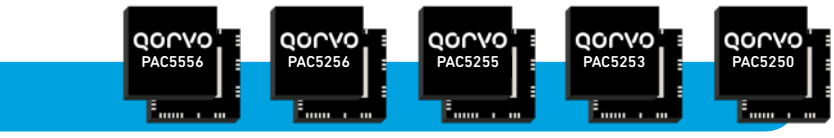
The PAC5xxx family's efficient and highly configurable system architecture helps designers work faster and lowers the cost of creating AC motor control and drive solutions for a new generation of white goods and other AC-powered equipment.

The Qorvo PAC eco-system also enables faster time-to-market, by more than 50%, by providing customers with hardware, software, evaluation tools, and third-party design partners and production tools. IEC and UL Class B pre-certified firmware speeds system-level certification.

Designed With a Purpose

Qorvo's innovative power management solutions deliver a highly efficient, flexible platform for high performance, high reliability and high integration in motor control. Our scalable core platforms are used for charging, powering and embedded digital control systems for end applications in the industrial, commercial and consumer equipment markets.





For more information about our modular PMICs, visit:
www.qorvo.com/products/power-management/intelligent-motor-controllers

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