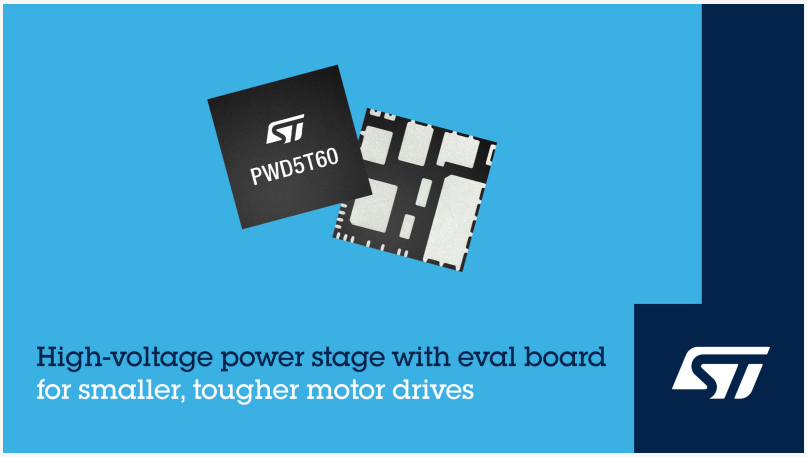
STMicroelectronics launches integrated high-voltage power stage with evaluation board for smaller, tougher motor drives

Gate driver, power MOSFETs, bootstrap diodes, and fast-acting protection all in one package save 70% of board space



ST three-phase driver for motor control

GENEVA, SWITZERLAND, September 18, 2024 /EINPresswire.com/ -- Accelerating development of compact and reliable fans and pumps built with energy-efficient motors, STMicroelectronics has introduced the PWD5T60 three-phase driver with a ready-to-use evaluation board that supports flexible control strategies.

Suited to applications up to 500V, the PWD5T60 integrates a gate driver and six power MOSFETs with RDS(ON) of 1.38Ω, enabling the device to achieve an outstanding energy to area rating. Zero-drop bootstrap diodes are also built-in, requiring minimal external components to complete the circuit in only 30% of the board area of an equivalent driver built with discrete components. The propagation delays of high-side and low-side MOSFETs are closely matched, which eliminates cycle distortion and maximizes flexibility to set the operating frequency for optimum response and energy efficiency.

The EVLPWD-FAN-PUMP evaluation board, released at the same time, helps developers quickly explore the value this driver can deliver in projects up to 100W. The board combines the PWD5T60 with an STM32G0 microcontroller (MCU) that can handle field-oriented control (FOC) or 6-step control of permanent magnet synchronous motors (PMSMs) and brushless DC (BLDC) motors. With configurable single or three-shunt sensing and leveraging the PWD5T60's high feature integration to achieve a compact, circular form factor, the board is optimized for use with fans and pumps. The board also features a power-supply stage to generate 12V and 3.3V supply voltages for the application and comes with a complete AC line filter at the input.

Featuring on-board bus-voltage sensing, the EVLPWD-FAN-PUMP board helps utilize the PWD5T60's safe design that provides undervoltage lockout (UVLO) for each bootstrap section to

prevent operation in dangerous or low-efficiency conditions. Engineered for robustness, the PWD5T60 also features cross-conduction prevention with interlocking and pre-programmed default deadtime to ensure failsafe protection against shoot-through currents. In addition, excellent below-ground robustness ensures faultless performance.

The PWD5T60 has a smart shutdown feature that uses a comparator for fast-acting overcurrent prevention. The output turns off immediately when a fault is detected, while the subsequent output-disable duration is programmed by connecting a capacitor and optional pull-up resistor to a dedicated pin. The turnoff response is unaffected by these components, letting product developers optimize the duration to allow time for faults to clear while always ensuring instant turn-off.

The driver has a wide input supply voltage range from 9V to 20V for optimum flexibility, while CMOS/TTL-compatible logic inputs down to 3.3V simplify interfacing with a host controller.

The PWD5T60 is in full production and available in a compact 12mm x 12mm VFQFPN package only 0.95mm high, from $3.28 for orders of 1000 pieces.

The EVLPWD-FAN-PUMP evaluation board is available now from the eSTore, at the budgetary price of $102.00. The board delivers plug-and-play convenience leveraging FOC and 6-step control firmware in the X-CUBE-MCSDK motor-control software development kit available free of charge at st.com.

Please visit https://www.st.com/pwd5t60 for more information.

Alexander Jurman
STMicroelectronics International NV
Alexander.Jurman@st.com
