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STMicroelectronics' 600V three-phase gate drivers combine flexibility, precision, and protection

Compact and highly integrated devices in advanced BCD6-OFFLINE technology target fans, pumps, and compressors

Geneva, November 12, 2026 -- STMicroelectronics has extended its STDRIVE family of three-phase gate drivers with two new 600V devices that let motor drives and inverters operate directly from a high-voltage bus. The STDRIVE631P and STDRIVE631N integrate three half-bridge drivers for N-channel power MOSFETs or IGBTs in a compact SO-28 package, for applications such as fans, pumps, and compressors for white goods.



Leveraging ST's advanced BCD6-OFFLINE technology for superior ruggedness and extreme robustness to below-ground spikes up to 100V, both devices feature outputs capable of sourcing 1.0A and sinking 0.85A. Each output integrates a zero-drop bootstrap diode, and propagation delays are matched for all channels.

Allowing extra flexibility for designers, the STDRIVE631P uses positive (active-high) input logic, while the STDRIVE631N uses negative (active-low) logic. Protection includes an integrated comparator with smart shutdown to handle faults such as overcurrent and overtemperature. Interlocking and deadtime control prevent cross conduction, and under-voltage lock-out (UVLO) for low-side and high-side driving sections prevents operation in inefficient or unsafe conditions.

The devices' small package size and full feature set combine to minimize the bill of materials, simplify PCB layout, and reduce overall system size. Integrated bootstrap diodes eliminate external high-side supply components, while the overcurrent protection and UVLO provide significant savings when compared with discrete gate-drive solutions. Each device has a

dedicated input pin for each channel and a dedicated enable pin that simplifies entering low-power shutdown mode.

EVLSTDRIVE631P and EVLSTDRIVE631N evaluation boards are also available. Each contains a complete three-phase inverter built with STGD6M65DF2 IGBTs. Featuring selectable single- or three-shunt current sensing, the boards interface with STM32 microcontrollers through a 34-pin motor-control connector for a fast start to field-oriented control (FOC) or six-step control development.

STDRIVE631x devices provide ±50V/ns of dV/dt transient immunity and are protected against electrostatic discharge (ESD) events of up to 2kV (HBM).

The STDRIVE631P and STDRIVE631N are in production now, in the SO-28 package, and rated for the extended temperature range of -40°C to 125°C. Pricing starts from $1.49 for orders of 1000 pieces.

The evaluation boards, EVLSTDRIVE631P and EVLSTDRIVE631N, are available through the eSTore.

Please visit www.st.com/stdrive631p for more information.