

STMicroelectronics' fast-switching GaN drivers add smart protection for motion control and power conversion

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STMicroelectronics has announced two new high-speed half-bridge gate drivers that bring gallium-nitride (GaN) efficiency, thermal performance, and miniaturization to a broad range of power and motion-control applications.

The [STDRIVEG212](#) and [STDRIVEG612](#) deliver tightly controlled 5V gate-drive signals to enhanced-mode GaN HEMTs,

powered from a high-side voltage up to 220V or 600V respectively. The drivers are highly integrated, with high-side and low-side 5V linear regulators (LDOs), a high-side bootstrap diode, and protection including under-voltage lock-out (UVLO), in a compact QFN package.

An integrated fast-startup voltage regulator stabilizes the supply voltage for the driver output stage, ensuring consistent gate control, while an embedded comparator turns off both GaNs on detecting overcurrent. Smart shutdown (SmartSD) automatically holds the switches off long enough to cool down and a fault pin provides overcurrent, overtemperature and UVLO reporting.

The drivers are featured to maximize the benefits of GaN technology, particularly in hard-switching applications such as motion control. The propagation delay of just 50ns is closely matched between high side and low side, with high-side start-up time of 5 μ s and \pm 200V/ns dV/dt transient immunity, permitting high rotational speeds.

The integrated LDOs have high current capability and provide separate sink and source paths, sinking up to 1.8A/1.2 Ω , and sourcing 0.8A/4.0 Ω . The gate driver output architecture lets designers differentiate the turn-on and turn-off impedance to optimize dV/dt and dI/dt and thereby avoid using turn-off diodes. This permits a lower bill of materials, reduced gate-loop inductance, and faster turn-off with increased margin to prevent unwanted induced turn-on.



With 20V-tolerant logic inputs and a dedicated shutdown pin to save power during inactive periods, the STDRIVEG212 and STDRIVEG612 ease system design and integration. The EVLSTDRIVEG212 evaluation board is suitable for both devices and is available now.

The STDRIVEG212 and STDRIVEG612 are industrial-grade devices, qualified to operate from -40°C to 125°C. Both are in production now and available in a 4mm x 5mm QFN package, priced from \$1.25 for orders of 1000 pieces.

For more information please visit https://www.st.com/content/st_com/en/campaigns/innovative-gan-gate-drivers-for-advanced-efficiency-and-reliability-asp-mcmotdri.html

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