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## Half-Bridge Gate Drivers Deliver Robustness And High Efficiency In Automotive Applications

[Nexperia's](#) NGD4300 and NGD4300-Q100 series gate-driver ICs are designed for driving both high-side and low-side N-channel MOSFETs in a synchronous buck or half-bridge configuration. These devices deliver high current output and excellent dynamic performance, boosting efficiency and robustness in applications. The automotive-qualified NGD4300-Q100 is well suited for electronic power steering and power converters, while the NGD4300 has been designed for use with dc-dc converters in consumer devices, servers and telecommunications equipment as well as for microinverters used in various industrial applications.

The floating high-side driver in these ICs can operate from bus voltages up to 120 V and use a bootstrap supply with an integrated diode, features which simplify overall system design and help to reduce PCB size (Fig. 1). They can deliver up to 4 A (peak) source and 5 A of sink current to guarantee short rise and fall times even for heavy loads.

Additionally, the gate driver has a low 13-ns delay and offers excellent channel-to-channel delay matching of only 1 ns. According to the vendor, these delays are significantly lower than for similar competing gate drivers and help to minimize deadtime by maximizing switching duty-cycle. Additionally, 4-ns rise and 3.5-ns (typical) fall times help to deliver higher efficiency and support high frequency and fast system control. These gate drivers accept input control signals complying with both TTL and CMOS logic levels.

"These devices are the first in our new portfolio of high-performance half-bridge gate drivers" according to Irene Deng, general manager of the IC solutions business group at Nexperia. "This release demonstrates how Nexperia is using process innovation to respond to the burgeoning demand for robust gate drivers that can increase power converter efficiency while also delivering smoother motor control in consumer, industrial and automotive applications."

For superior robustness in power conversion and motor driving applications, these ICs are fabricated using a silicon-on-insulator (SOI) process. This allows the negative voltage tolerance of the HS pin to extend to -5 V, significantly reducing the risk of damage caused by system parasitic components and unexpected spikes. The parts are available in DFN-8, SO-8 and HSO-8 packages (Fig. 2).

For more information, see the NGD4300-Q100 [page](#).

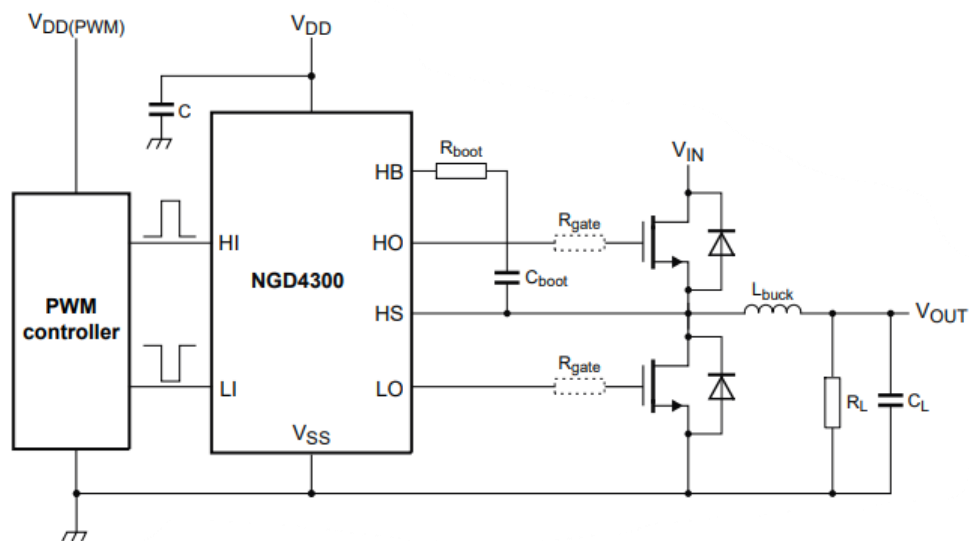


Fig. 1. The NGD4300 and NGD4300-Q100 are high-performance gate drivers designed to drive both high-side and low-side n-channel MOSFETs in a synchronous buck or a half-bridge configuration. The floating high-side driver can work with rail voltages up to 120 V and uses a bootstrap supply with an integrated diode. These drivers are said to increase power converter efficiency while also delivering smoother motor control



*Fig. 2. The NGD4300 and NGD4300-Q100 are offered in DFN-8, SO-8 and HSO-8 packages to offer engineers the flexibility to tradeoff device size and thermal performance, depending on application requirements.*