

High-voltage half-bridge GaN motor driver



QFN 9 x 9 x 1 mm



Product status link

[GANSPIN612](#)

Product label



Product summary

Order code	Package	Packing
GANSPIN612	QFN	Tray
GANSPIN612TR	9x9x1 mm	Tape and reel

Features

- Power system-in-package family integrating high-voltage GaN transistors in half-bridge configuration with high-voltage gate driver:
 - $R_{DS(ON)} = 270 \text{ m}\Omega$
 - $I_{DS(MAX)} = 5.5 \text{ A}$
- Reverse conduction capability and zero reverse recovery loss
- 10 V/ns typ. output dV/dt in both hard-on and hard-off, tailored for motor control
- Externally adjustable turn-on dV/dt
- Linear regulators to regulate high-side and low-side driver supply voltage
- Internal bootstrap diode
- Comparator for overcurrent detection with Smart Shutdown function
- UVLO protection on VCC, V_{HS} and V_{LS}
- Interlocking function, shutdown, standby and fault pins
- 55 ns gate driver leading to overall 150 ns typ. output propagation delay
- 3.3 V to 20 V compatible inputs with hysteresis and pull-down

Applications

- Home appliances
- Compressors
- Pumps
- Fans
- Personal care appliances
- Factory automation
- Servo drives
- Power tools

Description

GaN-based motion control is the focus of the GaNSPIN platform. Unlike many general-purpose solutions or those tailored for power conversion, the GaNSPIN series is specifically engineered to meet the peculiar demands of motion control systems.

The **GANSPIN612** is an advanced power system-in-package integrating two enhancement mode GaN transistors in half-bridge configuration driven by a state-of-the-art high-voltage, high-frequency gate driver.

The integrated power GaNs have $R_{DS(ON)}$ of 270 m Ω and 650 V drain source breakdown voltage, while the high-side of the embedded gate driver can be easily supplied by the integrated bootstrap diode.

The GANSPIN612, being designed for motion control, optimizes the output dV/dt to 10 V/ns typ. for both hard-on and hard-off. This is required in motor control for EMI, motor winding, and ball bearing reliability.

Robustness and reliability are also distinctive factors of the GaNSPIN series. Embedding advanced protections, GaNSPIN devices ensure the best possible system robustness. SmartShutdown overcurrent protection delivers the fastest response possible thanks to embedded logic and dedicated fast comparators.

The GANSPIN series also features linear regulators on both the lower and upper driving sections, preventing the power switches from operating in low efficiency or dangerous conditions, and the interlocking function avoids cross-conduction conditions. The UVLO is fine-tuned for motion control for optimal performances.

The GANSPIN612 is available in a compact 9x9x1 mm QFN package and operates in the industrial temperature range, -40 °C to 125 °C.

The GaNSPIN612 is pin-to-pin with GaNSPIN611 ($R_{DS(ON)}$ of 138 mΩ) to maximize scalability in a platform approach.

Revision history

Table 1. Document revision history

Date	Version	Changes
19-Nov-2025	1	Initial release.

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