

VIPower™ VNH5 series

Fully-protected, eco-friendly motor control solutions



Automotive-qualified full bridges covering a wide range of motor control applications

The VNH5 series of fully-integrated H-bridges offers a dedicated power stage and controls to drive DC motors. The series uses ST's proprietary VIPower™ M0-5 technology. Featuring advanced diagnostics and protection, this automotive-qualified product family offers best-in-class reliability. The combination of $R_{DS(on)}$ and packages covers a multitude of applications having different power requirements.

KEY FEATURES

- Cross-conduction protection
- Current limitation
- Over-temperature shutdown
- Power limitation (ST IP)
- PWM operation up to 20 kHz
- Charge pump output for reverse polarity protection
- Analog current sense output
- Overvoltage clamp and undervoltage shutdown
- Output protected against loss of ground and loss of V_{CC}
- Output protected against short to ground and short to V_{CC}
- Very low standby power consumption
- AEC-Q100 compliant

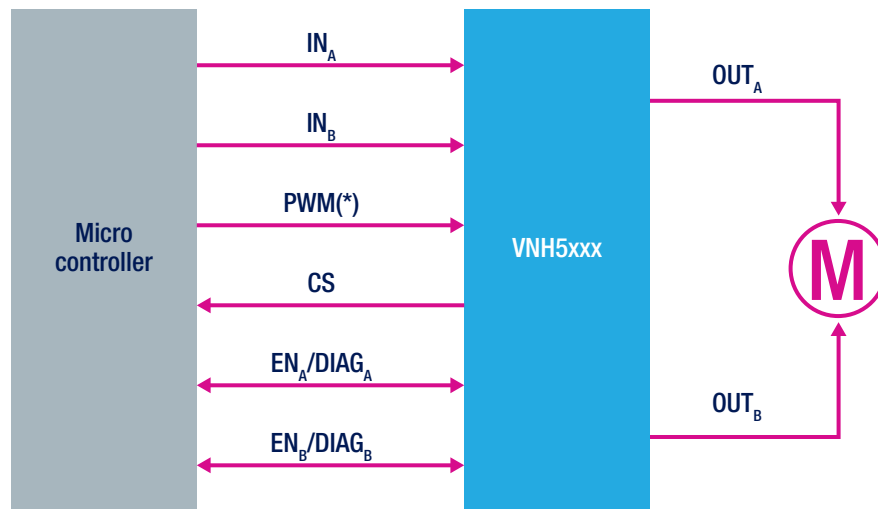
KEY BENEFITS

- Cost-effective and space-saving solution compared to discrete multi-package approach
- Embedded controls and protection for reduced microcontroller workload
- State-of-the-art reliability thanks to self-limiting fast thermal transient (power limitation)
- Robust solution designed to operate in the harsh automotive environment

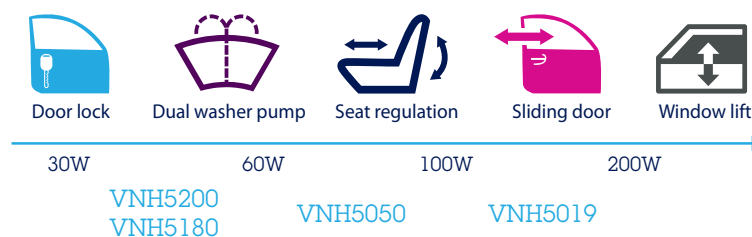
TYPICAL APPLICATIONS

Door locks, fan control, wipers, sun roofs, seat adjustment, and door/trunk closure

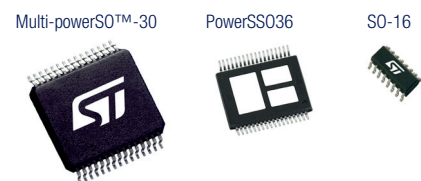
TYPICAL APPLICATION DIAGRAM



* Available on VN5180A VN5050A VN5019A



The VN5 series of H-bridges offers multiple solutions for actuating a wide range of DC motors, especially for automotive applications. Today, environmental regulations drive the market towards lighter and smaller silicon drivers ensuring reduced CO₂ emissions. The VN5 series, compared to a mechanical relay or multi-package solid-state solutions, is an eco-friendly and cost-effective approach integrating the power stage (two high-side and two low-side switches) plus dedicated control and diagnostic functions within the same package. VN5 products can be easily driven by a microcontroller through dedicated input pins, compatible with 3 V CMOS. These define motor direction (clockwise or counter-clockwise), speed (PWM controlled) and active braking. An embedded non-dissipative current sense output enables torque control and load disconnection detection. Its advanced diagnostics and protection functions are ideal for robust applications able to protect themselves against hazardous conditions.



VN5 SERIES MOTOR CONTROL ICs

Part number	On-state resistance $R_{DS(on)}$ typ (mΩ)	Current limitation (I_{lim}) typ (A)	PWM operation	Package	Easy Board order code (*)	Evaluation board order code	Highlights
VN5019A-E	18	50	•	MultiPowerSO-30	EVAL-VN5019-P1, EVAL-VN5019-P2	STEVAL-VN5019A	Outstanding thermal performances
VN5050A-E	50	42	•	PowerSS0-36	EV-VN5050A	STEVAL-VN5050A	Best trade-off between thermal performance and cost
VN5180A-E	180	12	•	PowerSS0-36	EV-VN5180A	STEVAL-VN5180A	Best trade-off between thermal performance and cost
VN5200AS-E	200	8		SO-16N			Cost-optimized plastic package

Note : *Easy Boards are simple evaluation tools assembling the device on optimized PCB for allowing simple connection to external environment

EVALUATION TOOLS

For information on the available evaluation tools, see st.com/automotive_evalboards



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