

# powerSTEP™

## Compact, powerful, accurate



### Integrated stepper motor driver delivers up to 10 A with superior smoothness and accurate positioning

powerSTEP widens ST's motor control ICs offer with a highly integrated system-in-package for stepper motors.

The power section, rated 85 V and 10 ARMS, is built with eight N channel, low  $R_{DS(on)}$ , 16-mΩ MOSFETs and is protected against over current and motor stall.

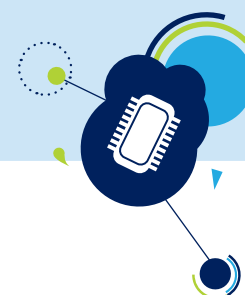
An advanced digital controller ensures smooth motion and accurate positioning with 1/128 step resolution and speed profile generation programmable through SPI-accessible registers.

#### KEY FEATURES

- Dual full bridge with  $R_{DS(on)} = 16 \text{ m}\Omega$
- 10 A<sub>RMS</sub> maximum output current
- Smoothness with up to 1/128 micro-steps/step
- Operating voltage: 7.5 V - 85 V
- Easily programmable with SPI
- Programmable speed profile and positioning
- Adjustable output slew rate
- Sensorless stall detection
- Full set of protection functions

#### KEY APPLICATIONS

- High-power bipolar stepper motors for:
  - Stage lighting
  - Surveillance systems
  - Textile and sewing machines
  - Pick-and-place machines



## INNOVATION IN MOTION

powerSTEP is an innovative system-in-package that integrates a fully digital programmable microstepping controller (1/128 micro-steps) and 8 N-channel 16 mΩ discrete MOSFETs in dual full bridge configuration. It is hosted in a small 11 x 14 mm<sup>2</sup> VQFN package and it is suitable for stepper motor applications requiring up to 85 V and 10 A.

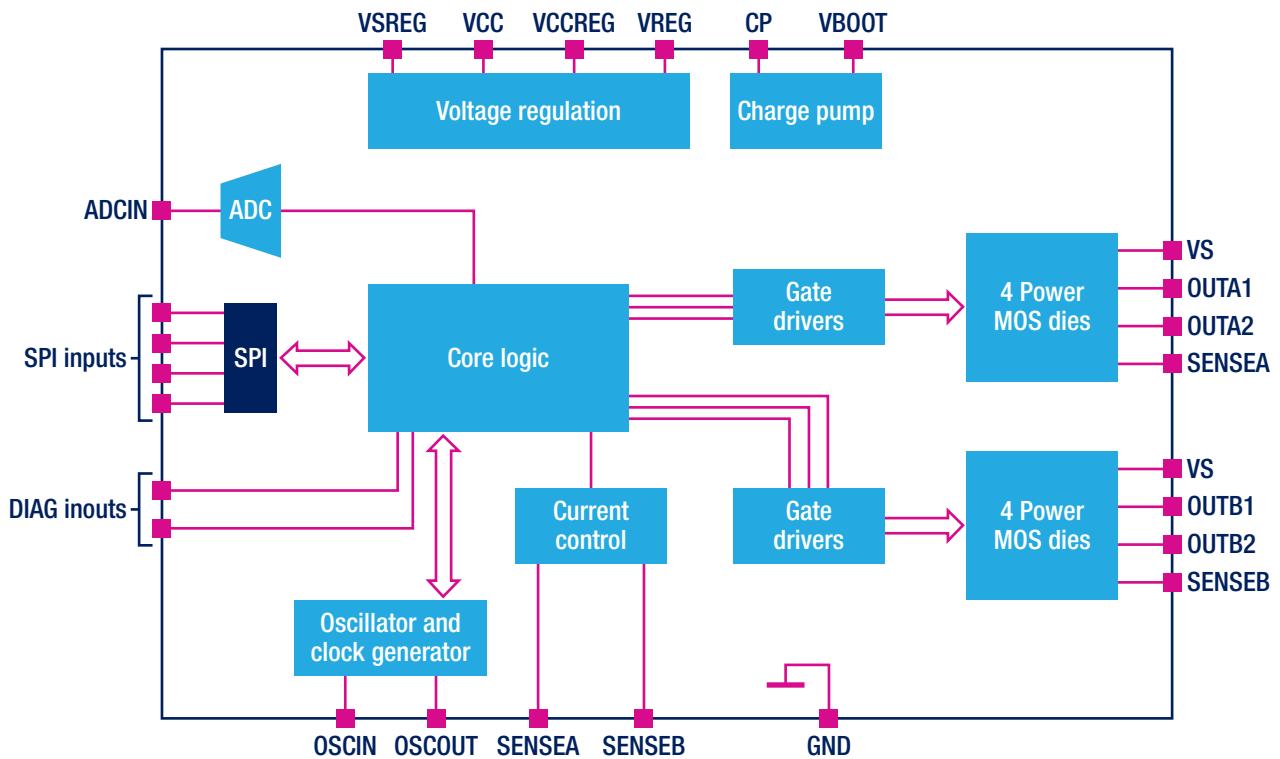
The controller can autonomously generate motion profiles with acceleration/deceleration ramps and velocity and position targets; all programmable through a set of commands and registers accessible via a standard 5-Mbit/s SPI. Support for daisy-chain operations in multi-motor applications helps save resources and I/Os on the host microcontroller.

Similarly, analog parameters setting – such as current protection trip point, dead-time, slew-rate, PWM frequency - can be performed on-the-fly just by changing the content of the appropriate register.

powerSTEP supports both current and voltage control modes to help optimize the design within a wider range of application requirements. The voltage control mode does not require external sense resistors and provides a smoother motion.

An extensive set of diagnostic features and protections, including thermal, low bus voltage, non-dissipative overcurrent and motor stall protection, makes the powerSTEP “bullet proof” as required by the most demanding motor control applications.

## BLOCK DIAGRAM



## DEVICE SUMMARY

Order code	Package	Packing	Evaluation board
POWERSTEP01/POWERSTEP01TR	VFQFPN 11 x 14 x 1.0 mm	Tube/Tape & reel	EVLPOWERSTEP01

