STSPIN motor drivers
The best things come in small packages

New low-voltage monolithic motor drivers deliver best-in-class performance for battery-operated systems

ST's new STSPIN low-voltage monolithic motor drivers, with their 3 x 3 mm QFN package are the smallest ICs in the world that integrate a power stage to drive stepper, single and double DC as well as 3-phase brushless DC motors.

Furthermore, they are optimized for the requirements of battery-operated systems in terms of low input voltage, low noise, and minimal power consumption at full load as well as in standby conditions.

Finally they provide accurate positioning and unprecedented smoothness of motion with up to 256 microsteps per full step.

KEY FEATURES AND BENEFITS

- Extremely low operating voltage 1.8 – 10 V, ideal for low-voltage, battery-operated motors

- High output current up to 1.3 A_{RMS} for each full-bridge

- Energy saving and long battery life with best-in-class standby consumption down to 80 nA

- Extreme position accuracy and motion smoothness with up to 256 microsteps per full step (STSPIN220)

- Maximum reliability UVLO, over-current and thermal protection

- Ultra-miniaturized 3 x 3 mm QFN package

TARGETED APPLICATIONS

Battery-powered stepper, DC, 3-phase brushless (BLDC) motors in applications such as:

- Toys
- Portable printers
- Robotics
- Point of sale (POS) devices
- Portable medical equipment
- Healthcare and wellness devices (shavers and toothbrushes)
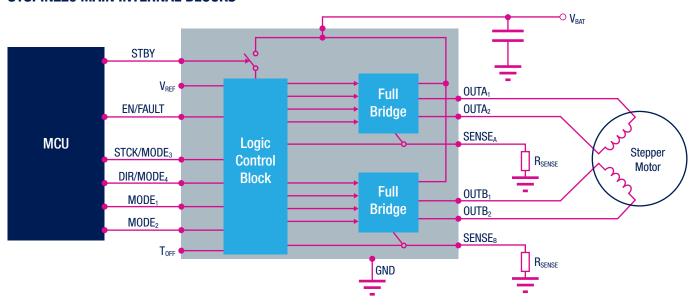
STSPIN MOTOR DRIVERS

ST's STSPIN monolithic motor drivers are now optimized for low-voltage, battery-powered, portable applications.

ST's excellence in motor control is now packed into a tiny IC, integrating both the control logic and a high-efficiency, low RDS(ON) power stage. The high-performance controller implements PWM current control with a programmable OFF time, and allows a position resolution of 256 microsteps per full step in the case of the STSPIN220, which is dedicated to stepper motors, for an unprecedented smoothness of motion.

The devices are designed to operate at low input voltages down to 1.8 V, over a wider current and temperature range, and can be forced in a zero consumption state – with quiescent current down to 80 nA – which allows significant power saving and makes these ICs ideal for battery-operated applications with an extended battery lifetime.

A complete set of protection features is present including over-current, over-temperature and short-circuit, thus making a bullet-proof solution for demanding applications, especially in harsh industrial environments, and further reducing the number of external components, the cost and complexity.

All this comes in a miniaturized 3 x 3 mm QFN package that perfectly fits into compact portable devices thanks to its miniscule footprint.

STSPIN220 MAIN INTERNAL BLOCKS

PRODUCT TABLE

Part number	Description	Typical $R_{DS(ON)}$ (Ω)	Minimum supply voltage (V)	Maximum supply voltage (V)	Maximum output current (A_{RMS})	Maximum peak output current- (A)	Expansion board for STM32 nucleo board
STSPIN220	Monolithic microstepping driver with up to 256 µsteps / step	0.2	1.8	10	1.3	2	X-NUCLEO-IHM06A1
STSPIN230	Monolithic driver for 3-phase brushless DC (BLDC) motors	0.2	1.8	10	1.3	2	X-NUCLEO-IHM11M1
STSPIN240	Monolithic driver for two DC motors	0.2	1.8	10	1.3	2	X-NUCLEO-IHM12A1
STSPIN250	Monolithic driver for single DC motors	0.1	1.8	10	2.6	4	X-NUCLEO-IHM13A1

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