STSPIN32F0H
High-Voltage Motor Controllers with Embedded STM32 MCU

STSPIN32 3-phase BLDC controllers extended to high voltage applications with 250V and 600V options

ST extends the flexibility of STM32-based motor controllers to high-voltage applications. Four pin-to-pin Systems-in-Package integrate an STM32 Cortex-M0 MCU and high-voltage 3-phase gate drivers, with embedded smartShutDown™. Advanced and fully protected 3-phase BLDC controllers are available for applications running up to 250 V and 600 V, at respectively two different gate currents of 0.35 A and 1 A. Thanks to the motor controllers’ high scalability in home appliances and industrial applications, designers can easily design and reuse their current hardware and firmware in all applications fitting main voltage supplies (110 VAC & 220 VAC), without having to change PCB.

KEY FEATURES & BENEFITS
250V and 600V three-phase gate drivers
- Up to 1 A gate current to drive a wide range of power MOSFETs and IGBTs
- Patented smartShutDown™ (smartSD) feature ensures fast and fail-proof protection against overload and overcurrent
- Integrated bootstrap diodes
- Cross-conduction, under-voltage and deadtime

STM32F0 MCU with ARM® Cortex®-M0 core
- 48 MHz, 4-Kbyte SRAM and 32-Kbyte Flash memories
- 12-bit ADC and 6 general purpose timers
- 21 GPIOs
- Bootloader for easy On-The-Fly firmware upgrades
- Communication interfaces: I²C, UART, and SPI

Ready-to-use development ecosystem
- Four general purpose evaluation boards
- Full support of FOC (1 and 3 shunts) and 6-step sensorless and sensored control algorithms
- Integrated in Motor Control Software Development Kit (MCSDK) 5.4.1 for easy firmware writing and fine-tuning

Available in a 64-pin 10 x 10 mm TQFP package
- Already implemented in industrial markets
- Minimal footprint ensured

KEY APPLICATIONS
- Consumer and industrial compressors
- Industrial drives, pumps and fans
- Air conditioning compressors & fans
- Corded power and garden tools
- Home appliances including battery-operated and 110 VAC-supplied appliances
- Industrial automation
STSPIN32F0H MAIN INTERNAL BLOCKS

PRODUCT TABLE

<table>
<thead>
<tr>
<th>Order code</th>
<th>Description</th>
<th>VIN_{min} (V)</th>
<th>VIN_{max} (V)</th>
<th>VOUT_{max} (V)</th>
<th>IGATE (A)</th>
<th>Related documents</th>
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<tr>
<td>STSPIN32F0251</td>
<td>250V 3-phase driver with STM32 MCU</td>
<td>8.5</td>
<td>20</td>
<td>250V</td>
<td>0.35</td>
<td>EVSPIN32F0251S1 product evaluation board STSW-SPIN32F0251S1 firmware for fast and easy evaluation of BLDC 1-shunt field-oriented control</td>
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<tr>
<td>STSPIN32F0252</td>
<td>Evaluation board coming soon</td>
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<td>1</td>
<td>Evaluation board coming soon</td>
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<tr>
<td>STSPIN32F0601</td>
<td>600V 3-phase driver with STM32</td>
<td>8.5</td>
<td>20</td>
<td>600V</td>
<td>0.35</td>
<td>EVSPIN32F0601S1 product evaluation board STSW-SPIN32F0601S1 firmware for fast and easy evaluation of BLDC 1-shunt field-oriented control</td>
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<td>STSPIN32F0602</td>
<td>EVSPIN32F0602S1 product evaluation board STSW-SPIN32F0602S1 firmware for fast and easy evaluation of BLDC 1-shunt field-oriented control</td>
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