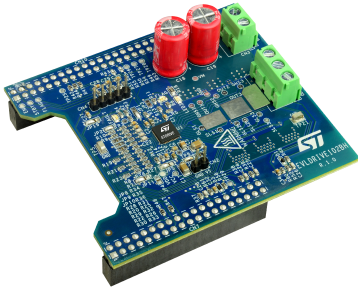


## STDRIVE102BH evaluation board for three-phase brushless motors



Product status link
<a href="#">EVLDRIVE102BH</a>
<a href="#">STDRIVE102BH</a>
<a href="#">STL220N6F7</a>

### Features

- Operating voltage from 6 V to 50 V
- Output current up to 12 A<sub>rms</sub>: power stage based on STL220N6F7 60 V, 1.2 mΩ N-channel power MOSFETs
- Three-shunt configuration
- STDRIVE102BH triple half-bridge gate driver:
  - Programmable gate current (up to 1 A source / 2 A sink)
  - Charge pump for 100 % duty cycle operation
  - Three embedded operational amplifiers and three comparators for current sensing and overcurrent detection
  - Full set of protections: UVLO, thermal shutdown, VDS monitoring
- Input connector for Hall-effect based sensors and encoder
- Motor BEMF sensing network
- Bus voltage sensing
- NTC temperature sensing
- Morpho connectors compatible with a wide range of STM32 NUCLEO boards

### Applications

- Battery supplied power tools
- Portable vacuum cleaners
- E-bikes
- Industrial automation
- Robotics
- Pumps and fans

### Description

The **EVLDRIVE102BH** evaluation board is a three-phase inverter based on the STL220N6F7 power MOSFETs. This evaluation board allows a full evaluation of the features of the STDRIVE102BH, a triple half-bridge gate driver.

The power stage uses a three-shunt topology: the current sensing and the overcurrent protections are implemented using the three operational amplifiers and the three comparators embedded in the STDRIVE102BH.

The embedded protections of the STDRIVE102BH, such as the UVLO on the driving voltage and the VDS monitoring for each power MOSFET, ensure a safe driving operation of the power stage.

The EVLDRIVE102BH evaluation board is thermally protected by exploiting both the hardware thermal shutdown protection embedded in the STDRIVE102BH and also an onboard NTC sensor placed close to the power stage, for a firmware thermal protection.

The two diagnostic pins of the STDRIVE102BH, the nFAULT pin for the protection events and the FLAG pin for the drivers' supply warning, are both connected to the control board and are also visible through two different LED indicators.

The EVLDRIVE102BH evaluation board can support FOC and six-step motion control algorithms. In case the motor is equipped with positioning sensors, they can be connected to the connector for Hall-effect based sensors and for the encoder, in order to increase the precision of the control algorithms. Nevertheless, sensorless control algorithms can be implemented as well: each output phase of the inverter has a read-out network, which allows the sensing of the phase voltage/BEMF of the motor. In addition, the bus voltage sensing present on the board ensures that the control algorithms are properly implemented.

The EVLDRIVE102BH evaluation board is compatible with a wide range of Nucleo control boards, thus allowing the evaluation of the STDRIVE102BH together with different STM32 microcontrollers.

## 1 Specifications

Ratings of the board can be found in Table 1.

**Table 1. EVLDRIVE102BH - specifications**

Parameter		Value
Supply voltage	Nominal	From 6 V to 50 V
Maximum current	Continuous <sup>(1)</sup>	12 A <sub>rms</sub>
	Peak	25 A
Maximum power	Continuous <sup>(1)</sup>	350 W

1. At 25 °C ambient temperature

## Revision history

**Table 2. Document revision history**

Date	Version	Changes
24-Mar-2025	1	Initial release.



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