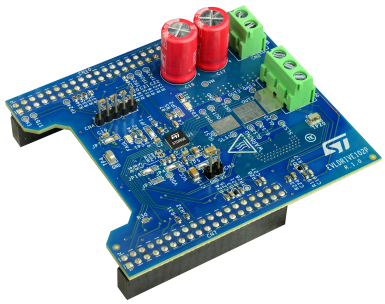
EVLDRIVE102BP

Data brief

STDRIVE102BP evaluation board for three-phase brushless motors



Product status link
EVLDRIVE102BP
STDRIVE102BP
STL220N6F7

Features

- Operating voltage from 6 V to 50 V
- Output current up to 12 A_{rms}: Power stage based on STL220N6F7 60 V, 1.2 mΩ N-channel power MOSFETs
- Three-shunt configuration
- STDRIVE102BP 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 PGAs and three comparators for current sensing and overcurrent detection
  - Full set of protections: UVLO, thermal shutdown, VDS monitoring
- Full configuration and diagnostic through SPI
- Input connector for Hall-effect based sensors and encoder
- Motor BEMF sensing network
- Bus voltage sensing
- NTC temperature sensing with connection to the auxiliary input of the embedded comparator
- 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 EVLDRIVE102BP 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 STDRIVE102BP, a triple half-bridge gate driver.

The STDRIVE102BP is fully configurable by setting its internal registers through the SPI interface. Moreover, the status of the device and its internal protections can be monitored in real-time by accessing its status registers.

The power stage uses a three-shunt topology: the current sensing and the overcurrent protections are implemented using the three programmable gain amplifiers (PGAs) and the three programmable comparators embedded in the STDRIVE102BP.

The embedded protections of the STDRIVE102BP, 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 EVLDRIVE102BP evaluation board is thermally protected by exploiting both the hardware thermal shutdown protection embedded in the STDRIVE102BP and also an onboard NTC sensor placed close to the power stage, for a firmware thermal protection. For further flexibility, one of the three comparators can be used to monitor the NTC value, in order to implement an auxiliary hardware thermal protection.

The nFAULT pin and the FLAG pin of the STDRIVE102BP, fully configurable via SPI for custom diagnostics, are both connected to the control board and are also visible through two different LEDs indicators.

The 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 EVLDRIVE102BP evaluation board is compatible with a wide range of Nucleo control boards, thus allowing the evaluation of the STDRIVE102BP together with different STM32 microcontrollers.

1 Specifications

Ratings of the board can be found in Table 1.

Table 1. EVLDRIVE102BP - specifications

Parameter		Value
Supply voltage	Nominal	From 6 V to 50 V
Maximum current	Continuous (1)	12 A_{rms}
	Peak	25 A
Maximum power	Continuous (1)	350 W

1. *At 25 °C ambient temperature.*

Revision history

Table 2. **Document revision history**

Date	Version	Changes
16-Jan-2026	1	Initial release.

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