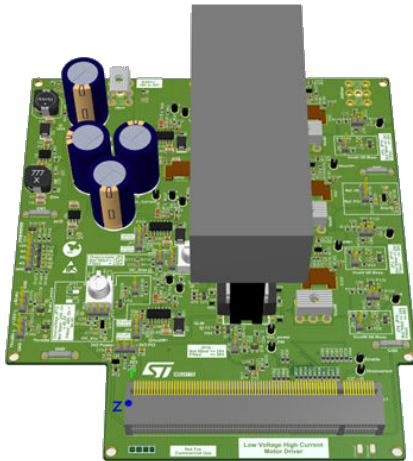


Reference design for low-voltage high-current inverter motor control board



STDES-LVHP01 global view. Picture is not contractual. PCB color may differ.

Features

Includes ST state-of-the-art patented technology

Reference design

- Low-voltage high-current inverter motor control board

Main features

- Input voltage (battery) from 18 V up to 48 V
- Output current per phase up to 50 A rms continuous
- PWM frequency from 10 kHz up to 70 kHz
- Hardware dead time set at 250 ns
- Hardware overcurrent protection fixed at 152 A or 236 A. A lower overcurrent value is possible through an onboard variable resistor.
- Overvoltage detection fixed at 48 V or 96 V. A lower overvoltage value is possible through an onboard variable resistor.

Controller board

- This board must be coupled with a dedicated ZeST Discovery board controller through the PCI port. Refer to [B-G473E-ZEST1S](#) for further details.

Description

The main objective of the low-voltage high-current inverter motor control board reference design is to recommend a layout and associated BOM for dedicated applications (this board is not for sale).

The **STDES-LVHP01** low-voltage high-current inverter motor control board, coupled with the [B-G473E-ZEST1S](#) ZeST Discovery board, can be used to drive a three-phase motor.

The board offers several sensorless strategies:

- Field-oriented control (FOC) with a three-shunt configuration
- FOC with a single-shunt configuration
- Six-step algorithm



Product status

STDES-LVHP01

1 General information

The **STDES-LVHP01** reference design uses the **B-G473E-ZEST1S** ZeST Discovery board. This Discovery board contains an **STM32G473QE** microcontroller, which is based on the Arm® Cortex®-M4 processor.

Note: Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.



2 STDES-LVHP01 codification

Table 1. STDES-LVHP01 reference design codification

Example:	STDES-	LV	HP	01
Device family				
STDES- = STMicroelectronics reference design				
Voltage type				
LV = Low-voltage board				
Power type				
HP = High-power board				
Board version				
STDES-LVHP01 board version = 01				

3 Hardware layout and configuration

For details on the hardware layout and configuration of the [STDES-LVHP01](#) reference design, refer to the *Low-voltage high-current inverter motor board* user manual (UM3489), available from www.st.com.

3.1 EDA resources

All board design resources, including schematics, EDA databases, manufacturing files, and the bill of materials, are available from the corresponding product page at www.st.com.

Revision history

Table 2. Document revision history

Date	Revision	Changes
18-Jun-2025	1	Initial release.

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