

## High-efficiency 250 W compressor solution based on STSPIN32F0601Q and STD8N60DM2



### Features

- Complete system solution made by ready-to-use hardware and firmware
- Fitting wide range of applications supplied from the mains, rated up to 250 W:
  - refrigerator compressors
  - pumps and fans
  - industrial appliances
- Market highest efficiency values:
  - Inverter efficiency > 96.5% at 3000 rpm
  - COP efficiency > 1.94 at 3000 rpm
- Based on the [STSPIN32F0601Q](#) intelligent three-phase motor controller with embedded STM32
- Power supply based on [VIPER122](#) in fly-back configuration to generate on-board DC voltages
- Inverter power stage based on [STD8N60DM2](#) MOSFETs rated 600 V and 8 A
- Equipped with proven sensorless field-oriented control (FOC) firmware in one-shunt or two- plus one-shunt topology
- Compact solution of only 7.5 x 11.2 cm
- RoHS compliant

### Description

The [STEVAL-CTM012V1](#) evaluation board is a three-phase inverter based on the [STSPIN32F0601Q](#) controller, which embeds a 3-phase 600 V gate driver and an Arm® Cortex®-M0 STM32 MCU.

The power stage features [STD8N60DM2](#) MOSFETs.

The board supports both one-shunt and two- plus one-shunt sensing topology. You can set the shunt topology by opportunely populating a set of jumpers.

Moreover, you can implement a sensorless field-oriented control (FOC). This allows driving permanent magnet synchronous motors (PMSMs) and brushless DC (BLDC) motors to cover a wide range of applications, such as refrigerator compressors, pumps, fans, and industrial appliances.

The [STEVAL-CTM012V1](#) evaluation board is compatible with a wide range of input voltages. It includes a power supply stage with the [VIPER122](#) in fly-back configuration that generates +15 V and +3.3 V supply voltages required by the application.

The companion firmware is [X-CUBE-MCSDK](#), available for download on [www.st.com](http://www.st.com), to be used with the [STSW-CTM011](#) firmware example for compressor motors.

You can compile, debug, and configure the firmware through the [STM32CubeIDE](#) and [B-STLINK-ISOL](#) plus [STLINK-V3SET](#).

SWD and UART TX-RX connectors are also available.

Product summary	
High-efficiency 250 W compressor solution based on STSPIN32F0601Q and STD8N60DM2	<a href="#">STEVAL-CTM012V1</a>
Firmware example for compressor motors	<a href="#">STSW-CTM011</a>
STM32 motor control software development kit	<a href="#">X-CUBE-MCSDK</a>
600 V three-phase controller with MCU	<a href="#">STSPIN32F0601Q</a>
N-channel 600 V, 550 mOhm typ., 8 A MDmesh DM2 Power MOSFET in a DPAK package	<a href="#">STD8N60DM2</a>
Applications	Motor Control

# Schematic diagrams

Figure 1. STEVAL-CTM012V1 circuit schematic (1 of 2)

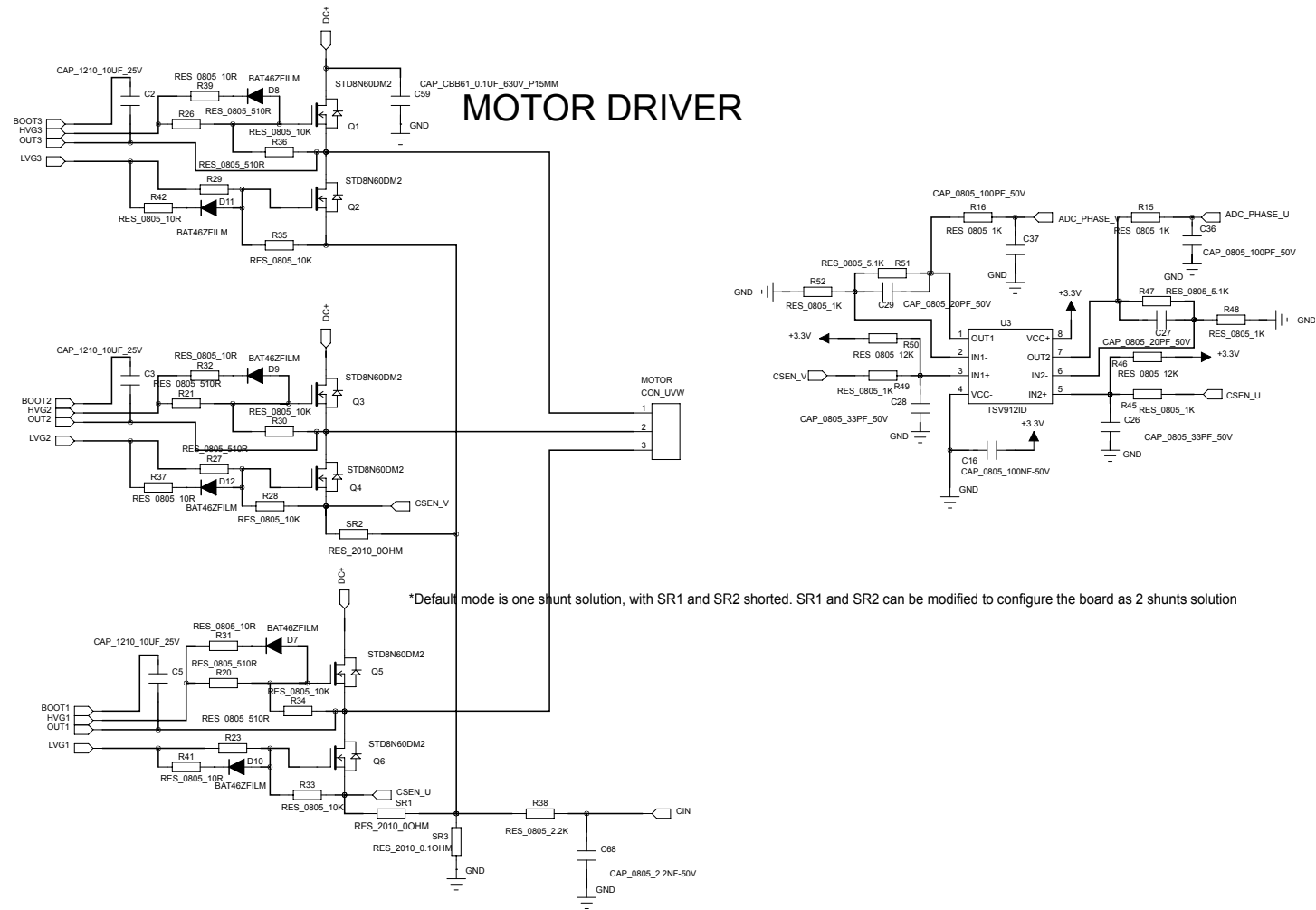
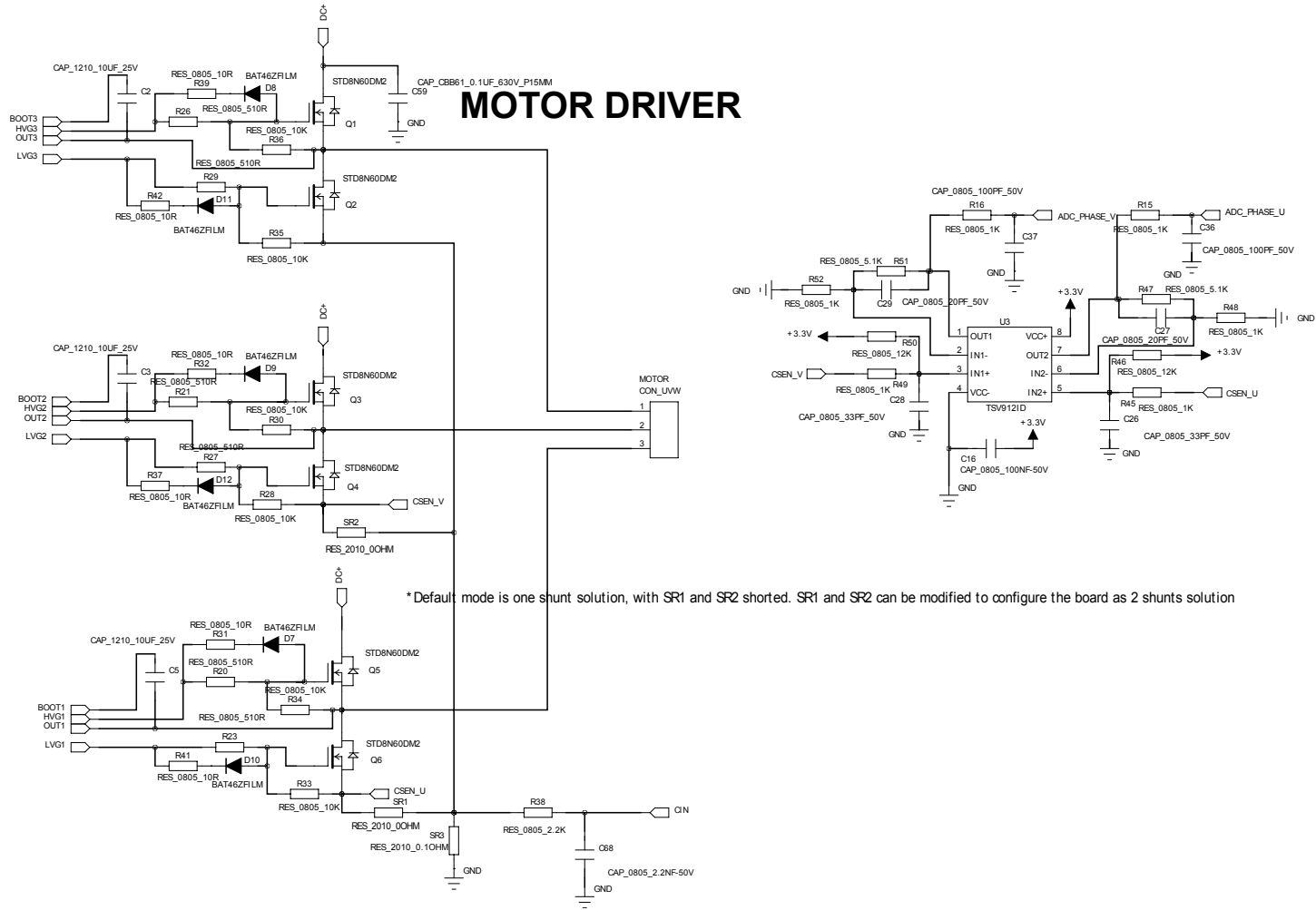


Figure 2. STEVAL-CTM012V1 circuit schematic (2 of 2)



## 2 Board versions

**Table 1. STEVAL-CTM012V1 versions**

Finished good	Schematic diagrams	Bill of materials
STEVAL\$CTM012V1A <sup>(1)</sup>	<a href="#">STEVAL\$CTM012V1A schematic diagrams</a>	<a href="#">STEVAL\$CTM012V1A bill of materials</a>

1. This code identifies the STEVAL-CTM012V1 evaluation board first version.

## Revision history

**Table 2. Document revision history**

Date	Revision	Changes
18-Nov-2021	1	Initial release.

**IMPORTANT NOTICE – PLEASE READ CAREFULLY**

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, please refer to [www.st.com/trademarks](http://www.st.com/trademarks). All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2022 STMicroelectronics – All rights reserved

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[STMicroelectronics:](#)

[STEVAL-CTM012V1](#)