STEVAL-IHM032V1

## 150 W inverter featuring the L639x and STGD3HF60HD for 1-shunt based sinusoidal vector control and trapezoidal scalar control

Features

- Compact size
- Wide-range input voltage
- Maximum power up to 150 W at 230 Vac input
- STGD3HF60HD: 4.5 A, 600 V very fast IGBT
- Compatibility with other power switches in DPAK packages (the STD5N52U and STGD6NC60HD, for example)
- AC or DC bus voltage power supply connectors
- Connector for interfacing with the STM3210xx-EVAL board, STEVAL-IHM022V1, and STEVAL-IHM033V1 with alternate functions (current reference, current limitation/regulation, method selection, current boost)
- Efficient DC/DC power supply (15 V, 3.3 V)
- Suitable both for sinusoidal FOC and trapezoidal BLDC drive
- Single-shunt current reading topology with fast operational amplifier (with offset insertion for bipolar currents)
- Hardware overcurrent protection with boost capabilities
- Temperature sensor
- BEMF-detection network for BLDC drive
- Current regulation/limitation network for BLDC drive
- Hall sensor/quadrature encoder inputs

Applications

- Dishwasher pumps
- Refrigerator compressors
- Fans
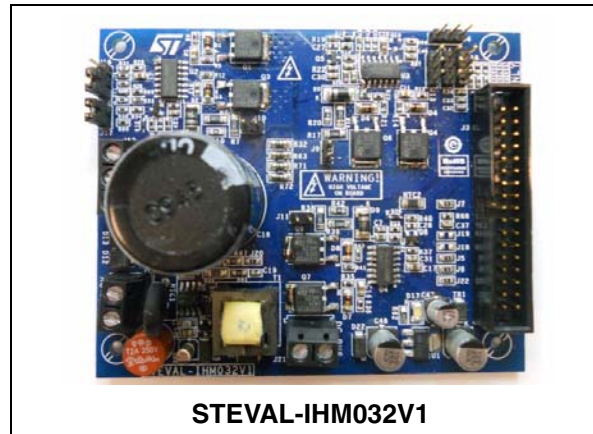
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Description

The STEVAL-IHM032V1 demonstration board is a 3-phase inverter designed to perform both the field-oriented control (FOC) of sinusoidal-shaped back-EMF permanent magnet synchronous motors (PMSMs) and trapezoidal control of brushless DC (BLDC) motors with or without sensors, with nominal power up to 150 W.

This flexible, open, high-performance system based on the L639x and STGD3HF60HD is specifically designed to achieve fast and accurate conditioning of the current feedback, thereby matching the requirements typical of high-end applications such as field-oriented motor control.

The board is compatible with 110 and 230 Vac mains, and includes a power supply stage with the VIPer12A-E (in flyback configuration) to generate the +15 V and +3.3 V supply voltage required by the application. Finally, the board can be interfaced through a dedicated connector with the STM3210xx-EVAL (STM32 microcontroller demonstration board), STEVAL-IHM022V1 (high-density, dual motor control demonstration board based on the STM32F103ZE microcontroller), and with the STEVAL-IHM033V1 (control stage based on the STM32F100 microcontroller suitable for motor control).

1 Schematic

Figure 1. Internal schematic

AM10125V1
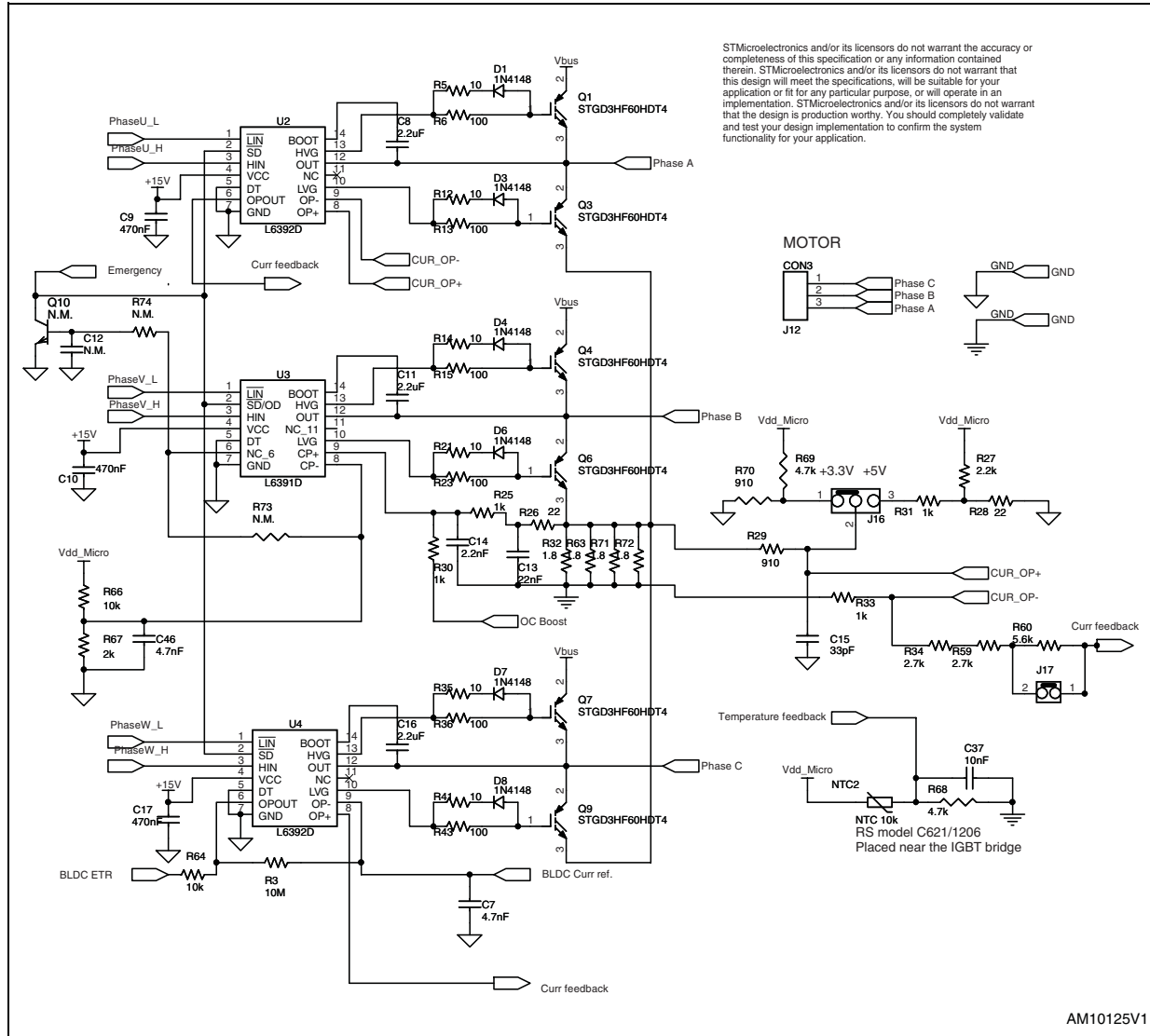
2   Revision history

Table 1.   Document revision history

Date	Revision	Changes
25-Oct-2011	1	Initial release.

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