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**

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).
Figure 1. Internal schematic
2 Revision history

Table 1. Document revision history

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<thead>
<tr>
<th>Date</th>
<th>Revision</th>
<th>Changes</th>
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<tbody>
<tr>
<td>25-Oct-2011</td>
<td>1</td>
<td>Initial release.</td>
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