STEVAL-IHM032V1

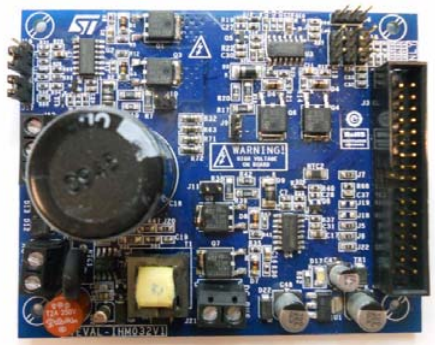
150 W inverter featuring the L639x and STGD3HF60HD for 1-shunt based sinusoidal vector control and trapezoidal scalar control

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



STEVAL-IHM032V1

Description

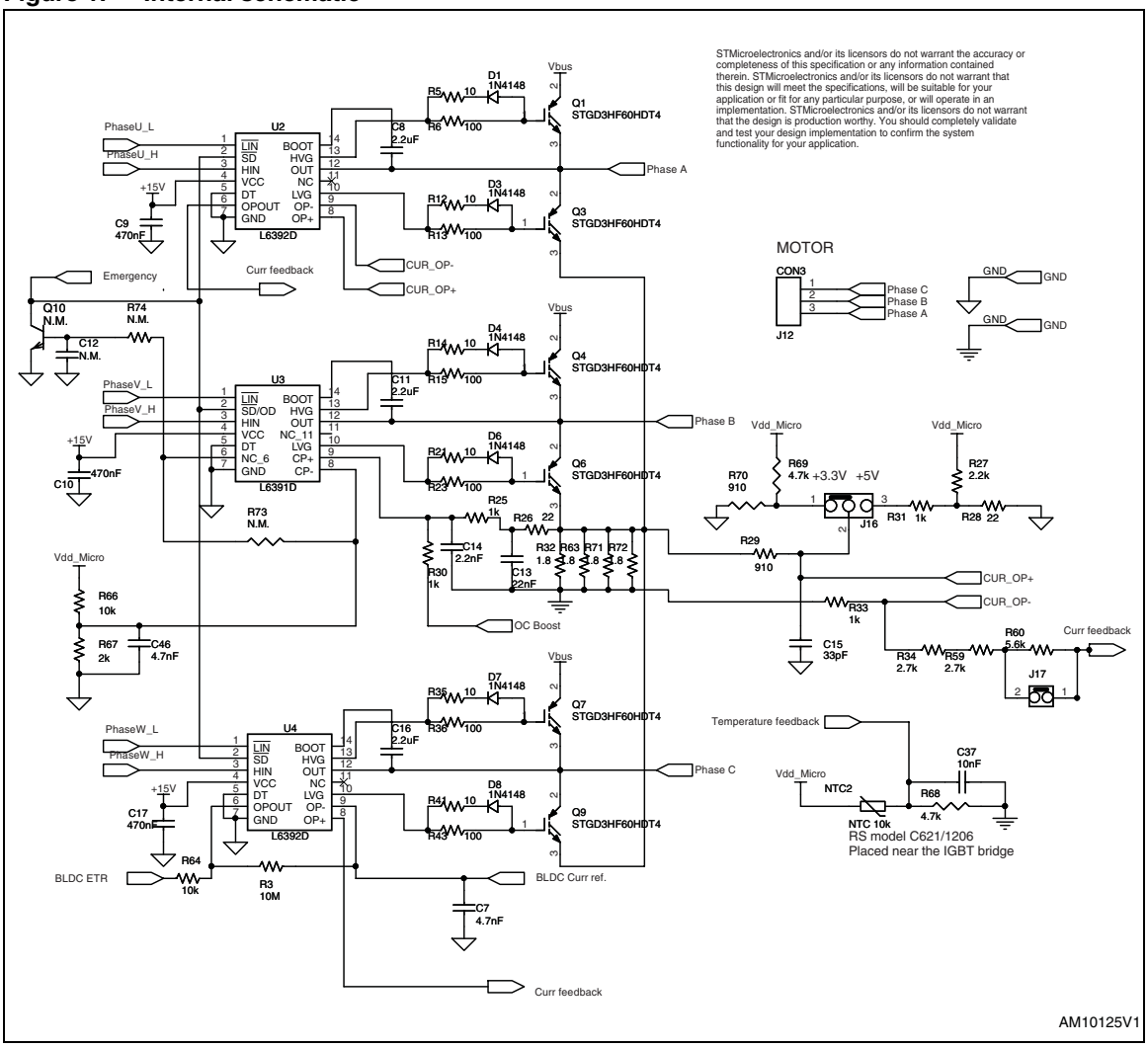
The STEVAL-IHM032V1 demonstration board is a 3-phase inverter designed to perform both the field-oriented control (FOC) of sinusoidal-shaped back-EMF permanent magnet synchronous motors (PMSMs) and trapezoidal control of brushless DC (BLDC) motors with or without sensors, with nominal power up to 150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



2 Revision history

Table 1. Document revision history

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

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST’s terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST’S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY TWO AUTHORIZED ST REPRESENTATIVES, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER’S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com