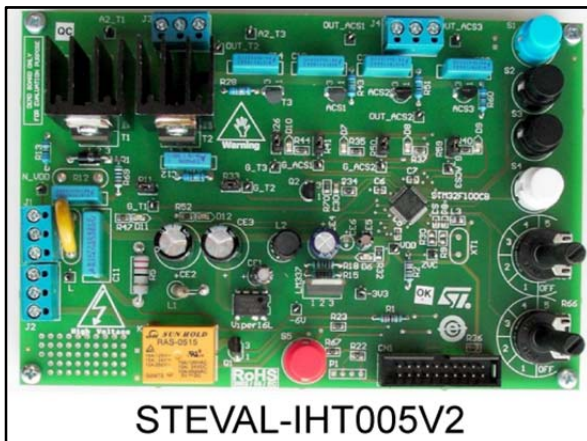


Demonstration board with full 3.3 V ACS/Triac control using the STM32F100

Data brief



- IEC 61000-4-4 pre-compliance test passed (burst up to 8 kV)
- IEC 61000-4-5 pre-compliance test passed (surge up to 2 kV)
- RoHS compliant

Description

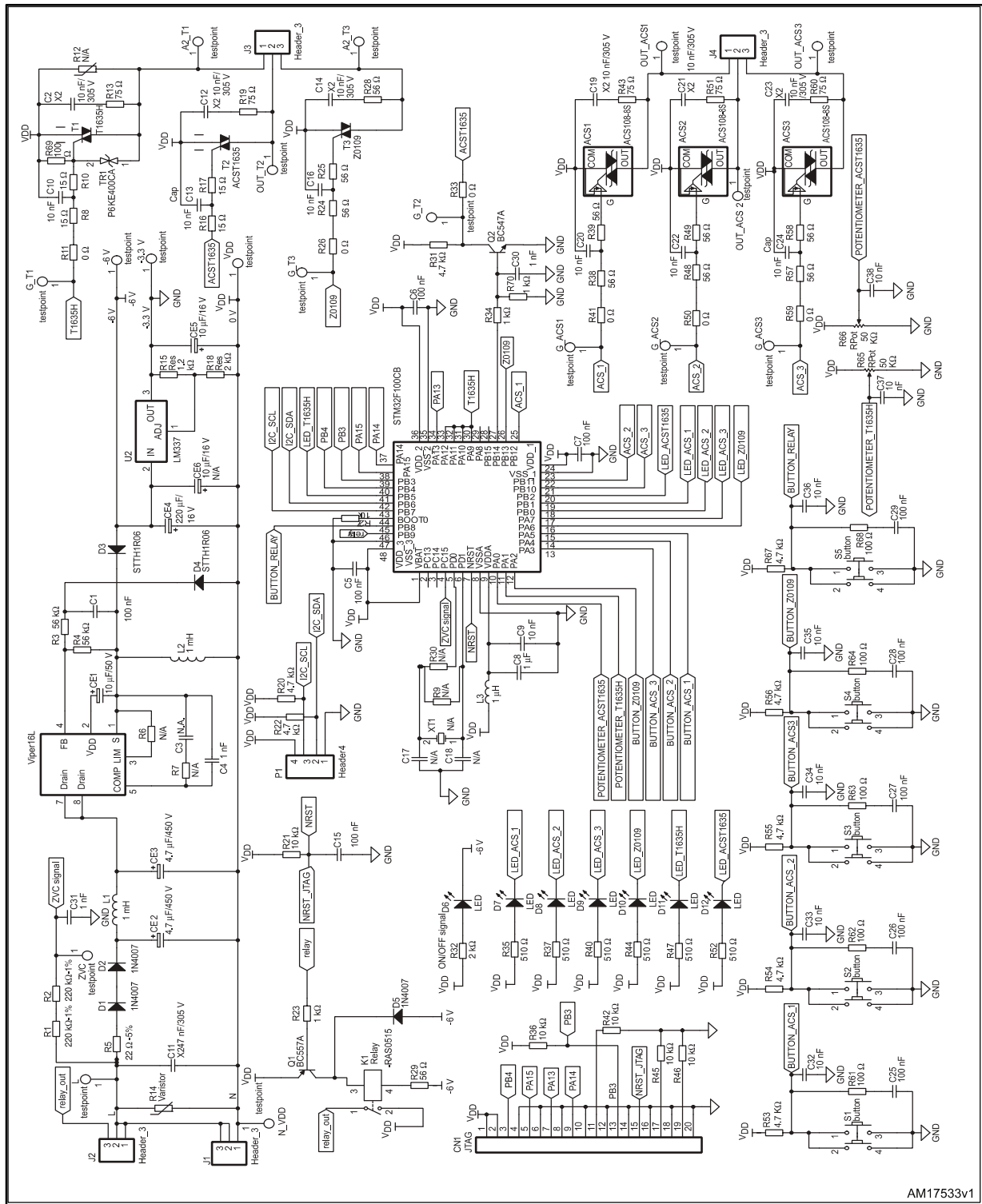
The STEVAL-IHT005V2 is designed as a complete solution proposal for home appliance applications based on STMicroelectronics™ components. Special emphasis is placed on demonstration of a robust full 3.3 V solution, based on 4 kV level in class A during an IEC-61000-4-4 (burst) test. The board also allows designers to evaluate the feasibility of AC switch control with a 3.3 V supply. Gate currents can be measured and compared to the information given in application note AN2986. STEVAL-IHT005V2 is based on the recently-introduced 48-pin, 32-bit STM32F100C4T6B MCU running at 24 MHz (RC user-trimmable internal RC clock), featuring 16 kBytes of Flash memory, 12-bit A/D converter, 5 timers, communication interfaces, and 4 kBytes of SRAM. The power supply circuitry is based on the VIPer16L, an offline converter with an 800 V avalanche-rugged power section, operating at 60 kHz. The power supply provides negative 6 V in buck-boost topology. The STEVAL-IHT005V2 can control 2 high power loads up to 2830 W thanks to the T1635H, a 16 A, 600 V high temperature Triac and up to 2050 W using the ACST1635-8FP, a 16 A, 800 V high temperature overvoltage-protected ACST device. The high power load control is based on phase-angle control. To limit inrush current and possible current peaks, the board features a soft-start routine and a smooth power change function for the high power loads. The STEVAL-IHT005V2 can also control 4 low power loads up to 100 W thanks to 3 ACS108-8S, 0.8 A, 800 V overvoltage-protected ACS devices and a Z0109, 1 A standard 4 quadrant 600 V Triac.

Features

- Complete solution for -3.3 V control
- Input voltage range: 90-265 VAC 50/60 Hz
- Negative 6 V/3.3 VDC aux power supply based on the VIPer16L in buck-boost topology
- Total power consumption in standby mode lower than 0.5 W for 264 V/50 Hz
- 48-pin, 32-bit value line family STM32F100C4T6B MCU as main controller
- Zero voltage switching (ZVS) interrupt to synchronize MCU events with voltage mains
- 1 x T1635H-6T and 1 x ACST1635-8FP for phase control of high power loads
- 5 discrete power level states with soft change for phase-angle controlled devices
- 1 x Z0109 and 3 x ACS108 for full wave control of low power loads
- Relay to demonstrate board noise robustness
- Red LED to indicate board mains supply
- Green LED for each ACS/ACST/Triac to indicate device on/off status
- JTAG programming connector
- External wire loop for gate current measurement
- I²C bus hardware/software ready

1 Schematic diagram

Figure 1: STEVAL-IHT005V2 circuit schematic



AM17533v1



2 Revision history

Table 1: Document revision history

Date	Revision	Changes
05-Aug-2013	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.

ST PRODUCTS ARE NOT AUTHORIZED FOR USE IN WEAPONS. NOR ARE ST PRODUCTS DESIGNED OR AUTHORIZED FOR USE IN: (A) SAFETY CRITICAL APPLICATIONS SUCH AS LIFE SUPPORTING, ACTIVE IMPLANTED DEVICES OR SYSTEMS WITH PRODUCT FUNCTIONAL SAFETY REQUIREMENTS; (B) AERONAUTIC APPLICATIONS; (C) AUTOMOTIVE APPLICATIONS OR ENVIRONMENTS, AND/OR (D) AEROSPACE APPLICATIONS OR ENVIRONMENTS. WHERE ST PRODUCTS ARE NOT DESIGNED FOR SUCH USE, THE PURCHASER SHALL USE PRODUCTS AT PURCHASER'S SOLE RISK, EVEN IF ST HAS BEEN INFORMED IN WRITING OF SUCH USAGE, UNLESS A PRODUCT IS EXPRESSLY DESIGNATED BY ST AS BEING INTENDED FOR "AUTOMOTIVE, AUTOMOTIVE SAFETY OR MEDICAL" INDUSTRY DOMAINS ACCORDING TO ST PRODUCT DESIGN SPECIFICATIONS. PRODUCTS FORMALLY ESCC, QML OR JAN QUALIFIED ARE DEEMED SUITABLE FOR USE IN AEROSPACE BY THE CORRESPONDING GOVERNMENTAL AGENCY.

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.

© 2013 STMicroelectronics - All rights reserved

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