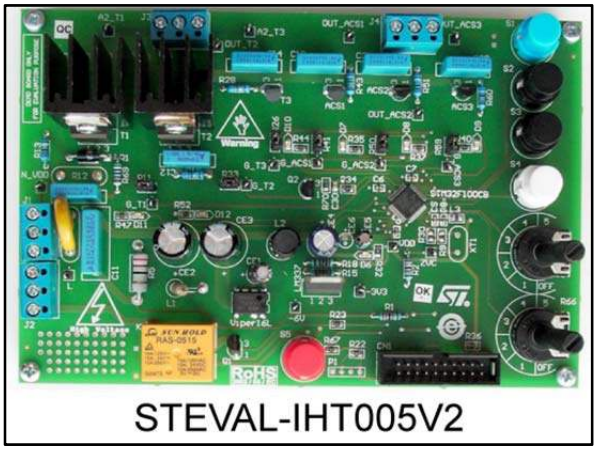
STEVAL-IHT005V2

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

Data brief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Features

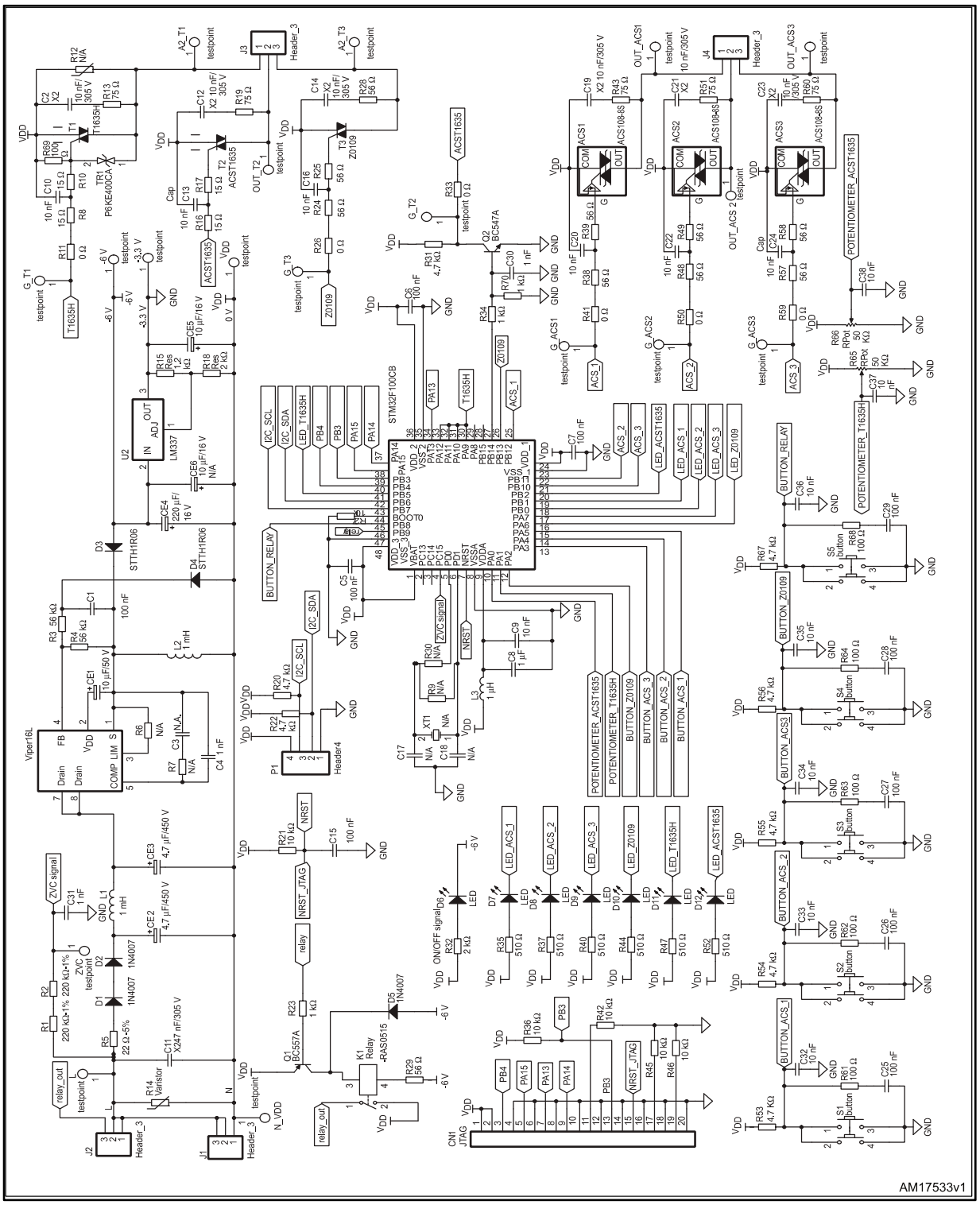
- Complete solution for -3.3 V control
- Input voltage range: 90-265 VAC 50/60 Hz
- Negative 6 V/3.3 VDC aux power supply based on the VIPer16L in buck-boost topology
- Total power consumption in standby mode lower than 0.5 W for 264 V/50 Hz
- 48-pin, 32-bit value line family STM32F100C4T6B MCU as main 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
- I^2C bus hardware/software ready
- 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.

1 Schematic diagram

Figure 1: STEVAL-IHT005V2 circuit schematic



2 Revision history

Table 1: Document revision history

Date	Revision	Changes
05-Aug-2013	1	Initial release.