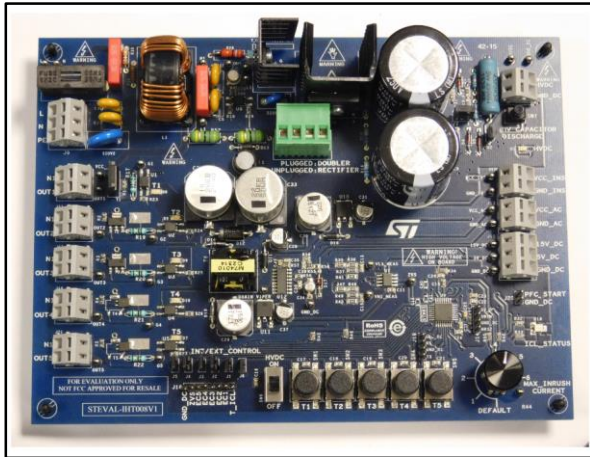


Low standby loss front-end with inrush current limitation and insulated AC switch control

Data brief



Description

The STEVAL-IHT008V1 evaluation board limits the inrush current charging a DC bus capacitor so that it is compliant with the IEC 61000-3-3 standard. This inrush current is based on a soft-start procedure for the rectifier bridge achieved with a Triac added in series with the mains line, which is controlled through progressive phase-control during the startup phase.

This solution drastically reduces standby losses as the DC bus can be totally disconnected from the AC mains when it is not required. The DC bus is easily turned off by turning off the series Triac, without needing an additional relay to open the circuit in standby.

Steady-state losses are also reduced because NTC resistors, traditionally used to limit inrush current, are not required; nor are the corresponding relays to bypass them.

This board also demonstrates that AC loads can be driven with an isolated easy-to-design solution by using the same power supply as the whole system and some opto-transistors which control the AC switches.

Features

- Fully electronic solution without the need for an inrush current limiter resistor and bulky by-pass electromechanical relay
- DC bus disconnection at standby to reduce loss below 0.3 W
- Inrush current compliant with IEC61000-3-3
- Operation allowed with PFC (continuous or discontinuous)
- EN 55015, IEC 61000-4-11 compliant
- Criteria A @ 2 kV IEC 61000-4-5 and @ 4 kV IEC 61000-4-4
- Insulated control of AC switches used to drive AC loads for residential appliances
- RoHS compliant

1 Schematic diagram

Figure 1: STEVAL-IHT008V1 power and insulated control schematic

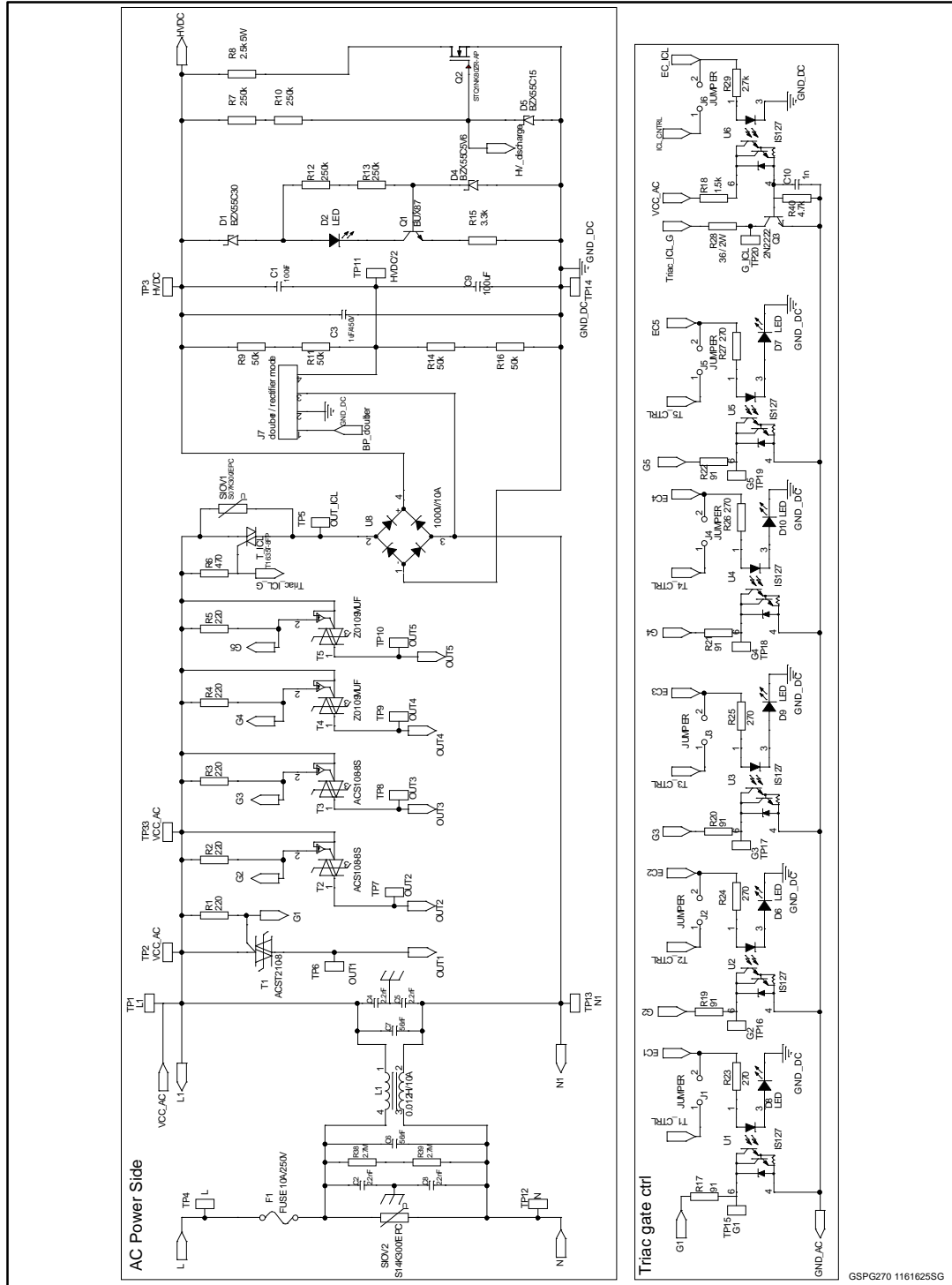


Figure 2: STEVAL-IHT008V1 control circuit schematic (1 of 3)

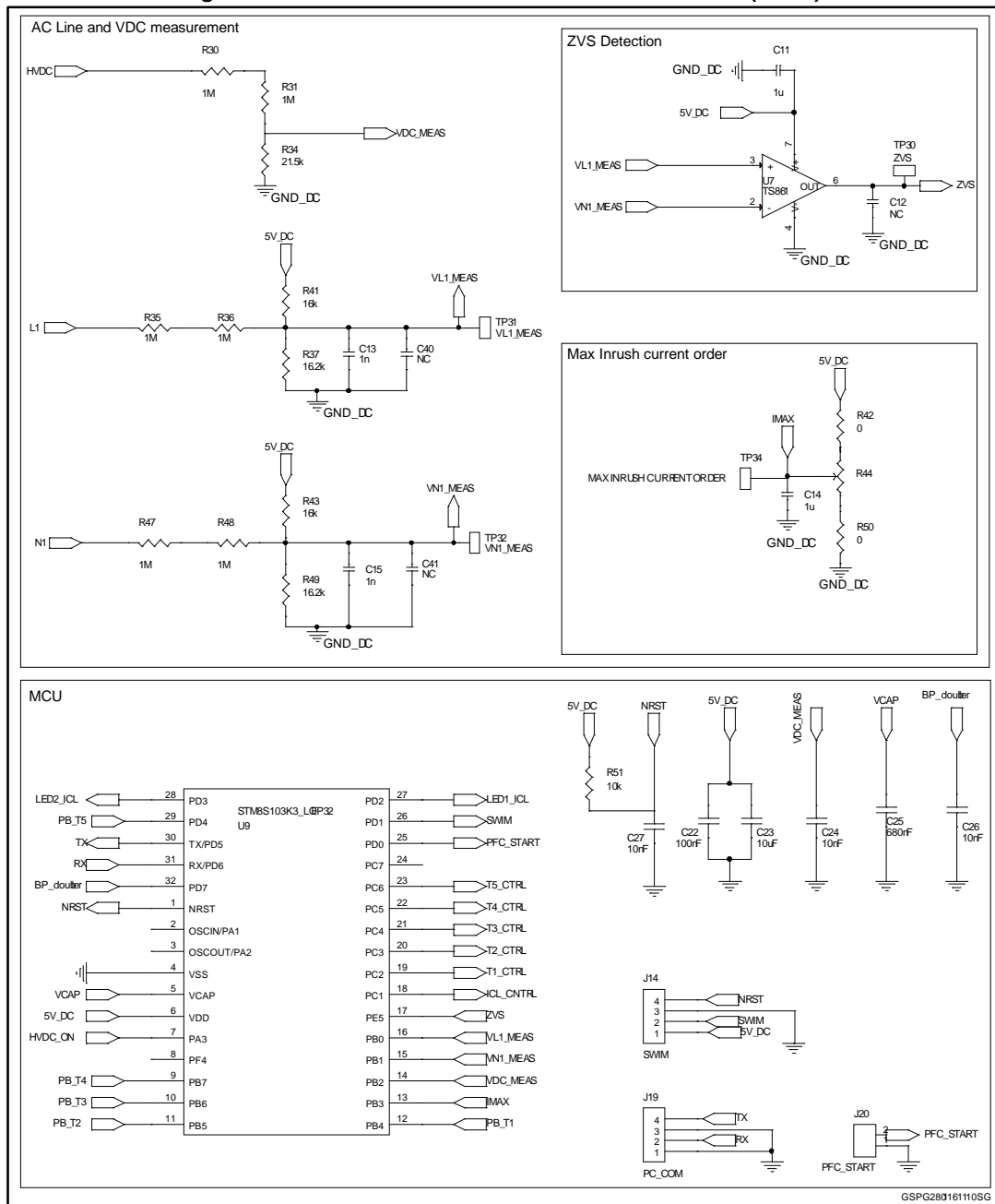


Figure 3: STEVAL-IHT008V1 control circuit schematic (2 of 3)

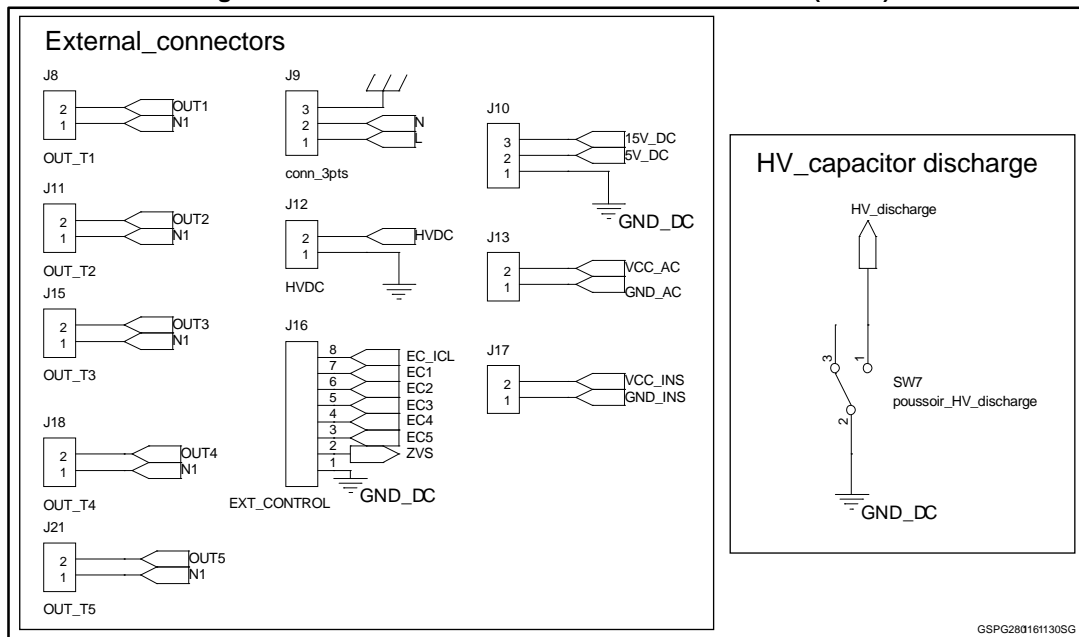
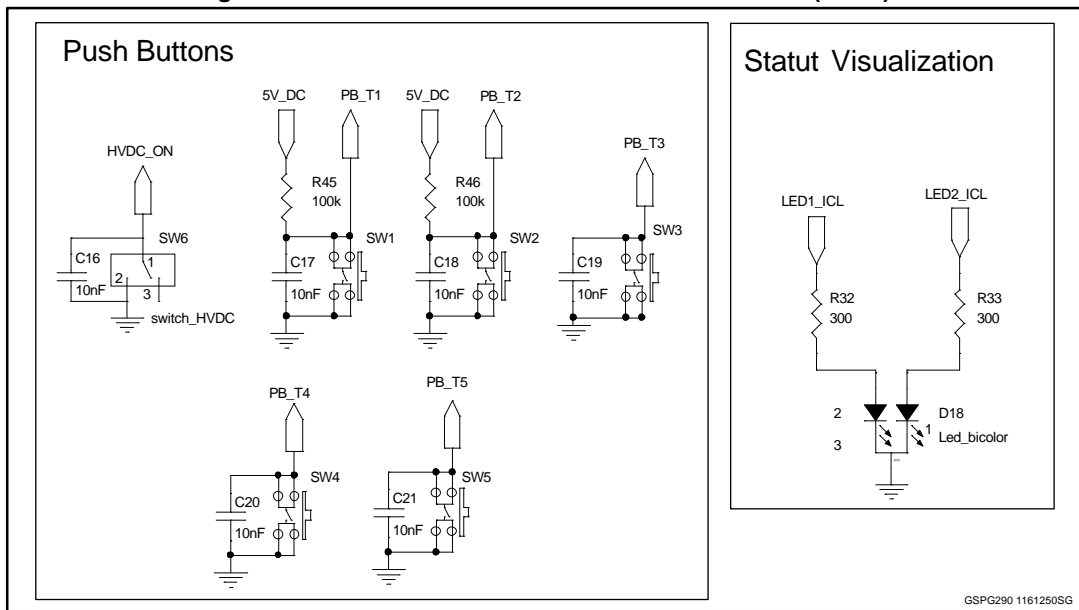


Figure 4: STEVAL-IHT008V1 control circuit schematic (3 of 3)



2 Revision history

Table 1: Document revision history

Date	Version	Changes
01-Feb-2016	1	Initial release.

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