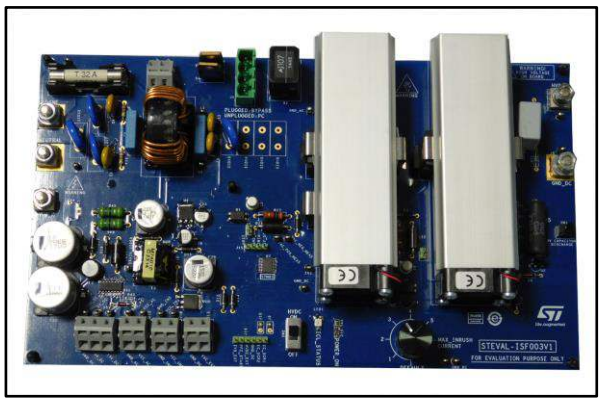
STEVAL-ISF003V1

Low standby losses power front-end with inrush current-limitation

Data brief



Features

- Fully electronic solution without the need for an inrush current limiter resistor and its bulky bypass electromechanical relay
- DC bus disconnection at standby to reduce losses below 0.3 W
- Inrush current compliance with IEC61000-3-3
- Operation allowed with PFC (continuous or discontinuous)
- Compliant with EN 55015, IEC 61000-4-11
- Criteria A at 4 kV IEC 61000-4-5 and at 4 kV IEC 61000-4-4
- RoHS compliant

Description

The STEVAL-ISF003V1 evaluation board allows the inrush-current which charges a DC bus capacitor to be limited to comply with the IEC 61000-3-3 standard. This inrush-current limitation is based on a soft-start procedure of the mixed bridge diodes and SCRs rectifier using progressive phase control at board start-up.

This solution can also drastically reduce standby losses as the DC bus can be totally disconnected from the AC mains when it does not have to operate. DC bus deactivation is simply achieved by turning off SCRs, without requiring an additional relay to open the circuit in standby.

The steady-state losses are also reduced, thanks to the removal of the NTC / PTC resistor traditionally used to limit inrush-current. Therefore, no relay is required to bypass this resistor as it is no longer used.

Schematic diagrams

Figure 1: STEVAL-IFS003V1 power and insulated control schematic

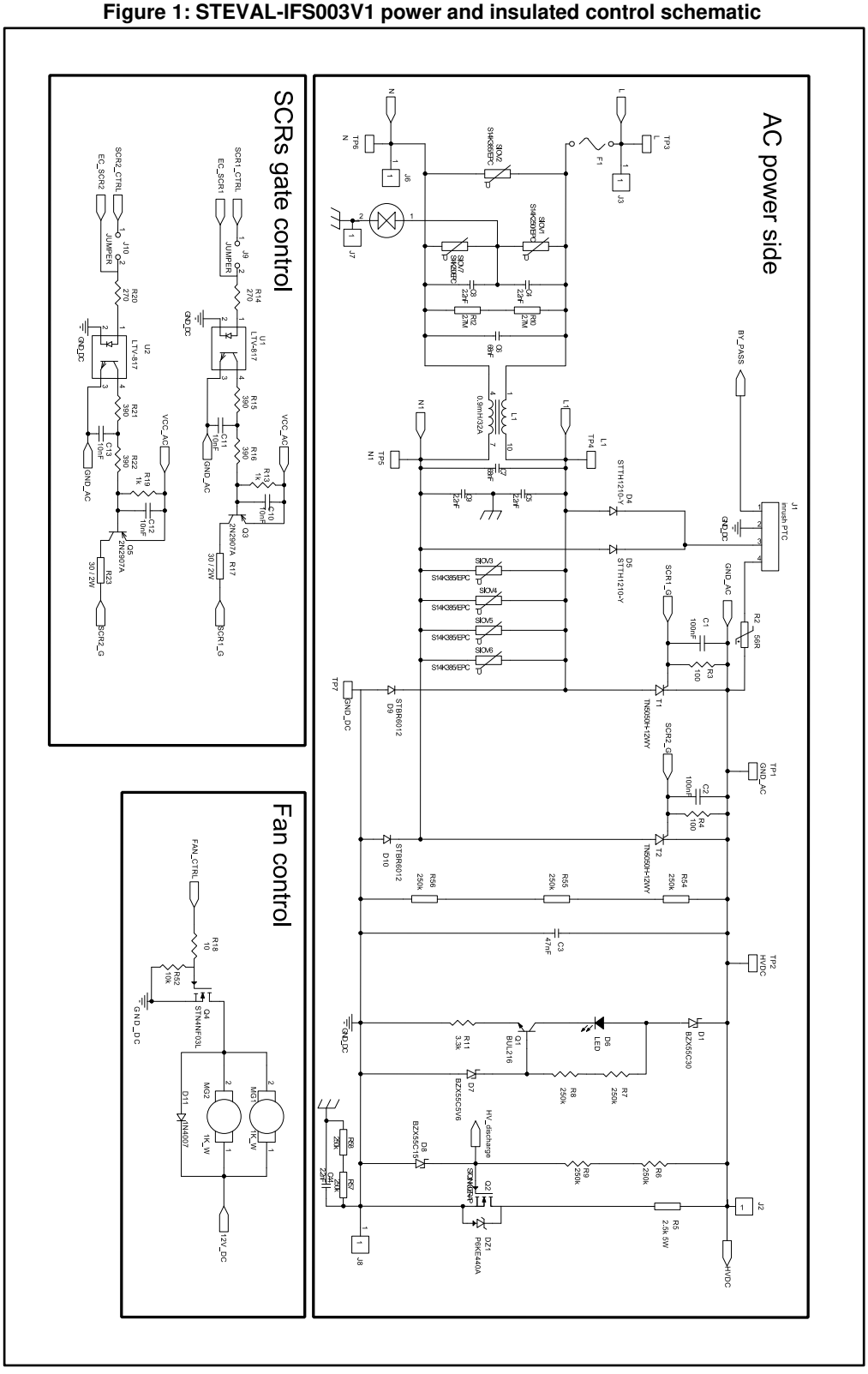


Figure 2: STEVAL-ISF003V1 control circuit schematic

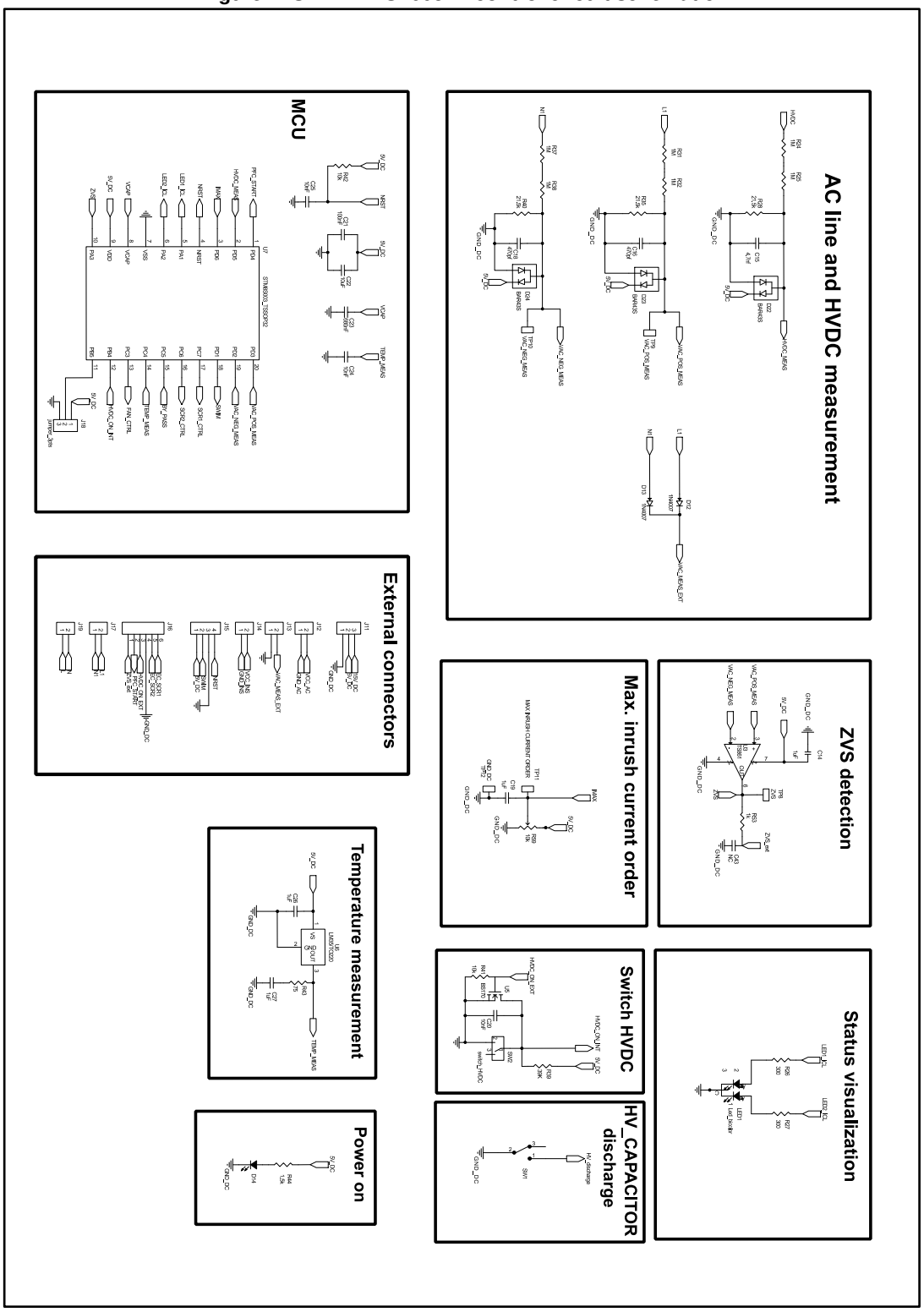
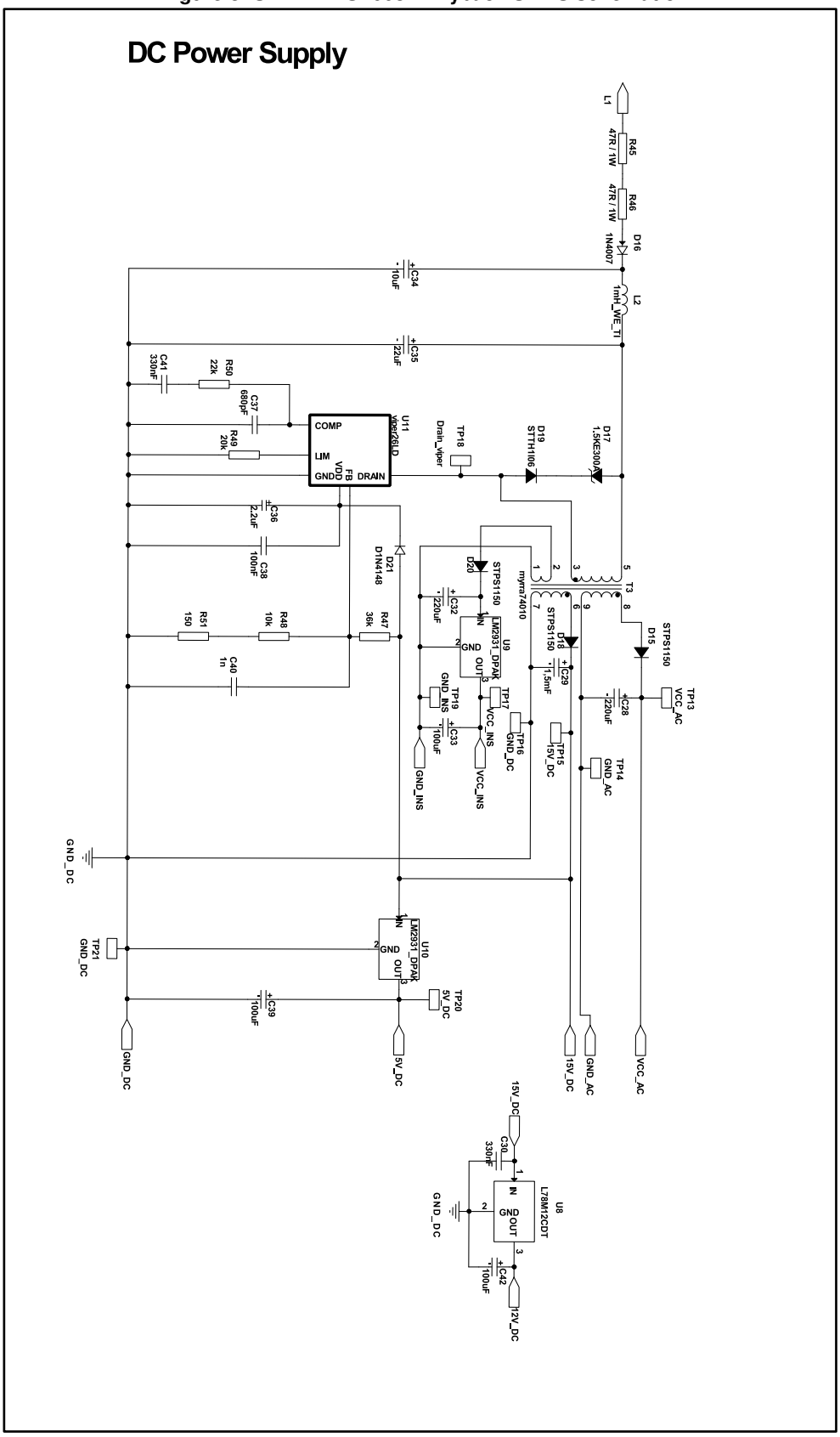


Figure 3: STEVAL-ISF003V1 flyback SMPS schematic



Revision history

Table 1: Document revision history

Date	Version	Changes
16-Jun-2016	1	Initial release.
18-Apr-2017	2	Updated *Section: "Schematic diagrams"*.

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