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48 V - 130 W high efficiency converter with PFC for LED street lighting applications based on L6562 and L6599

Data brief

Features

- Extended input mains range: 85 to 305 V_{AC} - frequency 45 to 55 Hz
- Output voltage: 48 V at 2.7 A
- Long-life, electrolytic capacitors not used
- Mains harmonics: in accordance with EN61000-3-2 Class C
- Efficiency at full load: greater than 90% at 115 V_{AC}
- EMI: in accordance with EN55022 Class B; EN55015
- Safety: double insulation, in accordance with EN60950, SELV
- Dimensions: 75 x 135 mm, 30 mm maximum component height
- PCB: single side, 35 μ m, FR-4, mixed PTH/SMT
- RoHS compliant

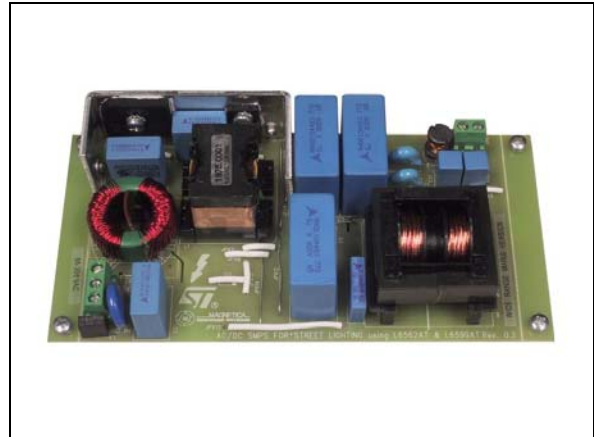
Description

The STEVAL-ILL053V1 demonstration board implements a 130 W LED power supply for street lighting.

The circuit is composed of two stages: a front-end PFC using the L6562AT and an LLC resonant converter based on the L6599AT.

The strengths of this design are its very high efficiency; wide input mains range (85-305 V_{AC}) operation and long-term reliability.

Because reliability MTBF (mean time between failures) in power supplies is typically affected by the high failure rate of electrolytic capacitors, unless using very high-end, expensive types, the STEVAL-ILL053V1 demonstration board offers an innovative design approach using film capacitors from EPCOS in place of electrolytic capacitors.

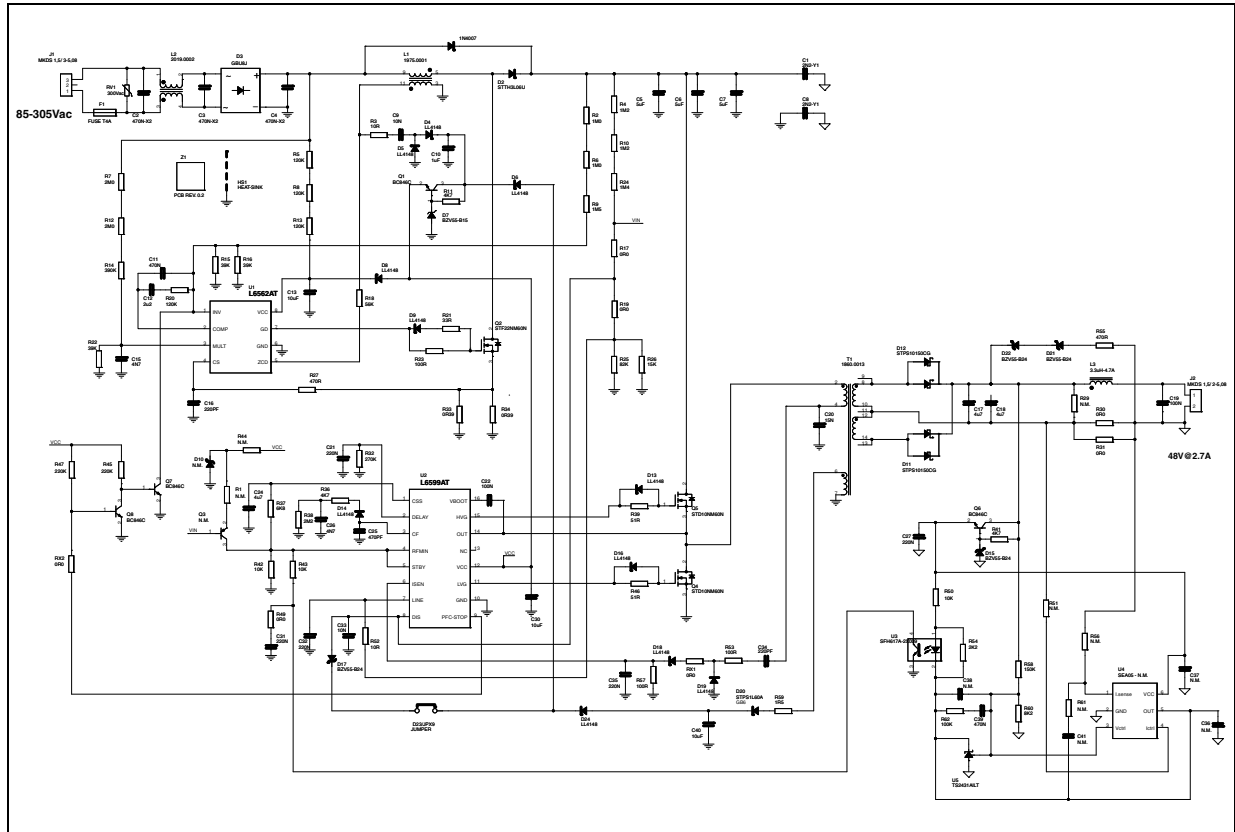


Thanks to the high efficiency achieved, just a small heatsink for the PFC stage is needed, while the other power components employ SMT (surface mount technology), like most of the passive components, thereby decreasing production labor cost.

The STEVAL-ILL053V1 demonstration board also provides protection against overload or short-circuit, open-loop by each stage, or input overvoltage, with auto-restart.

1 Schematic diagram

Figure 1. 48 V - 130 W street lighting SMPS - wide range version with TS2431



2 Revision history

Table 1. Document revision history

Date	Revision	Changes
25-Oct-2012	1	Initial release.

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