



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

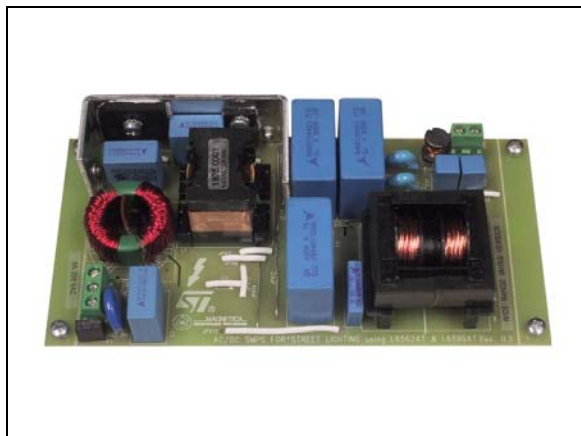
Description

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.

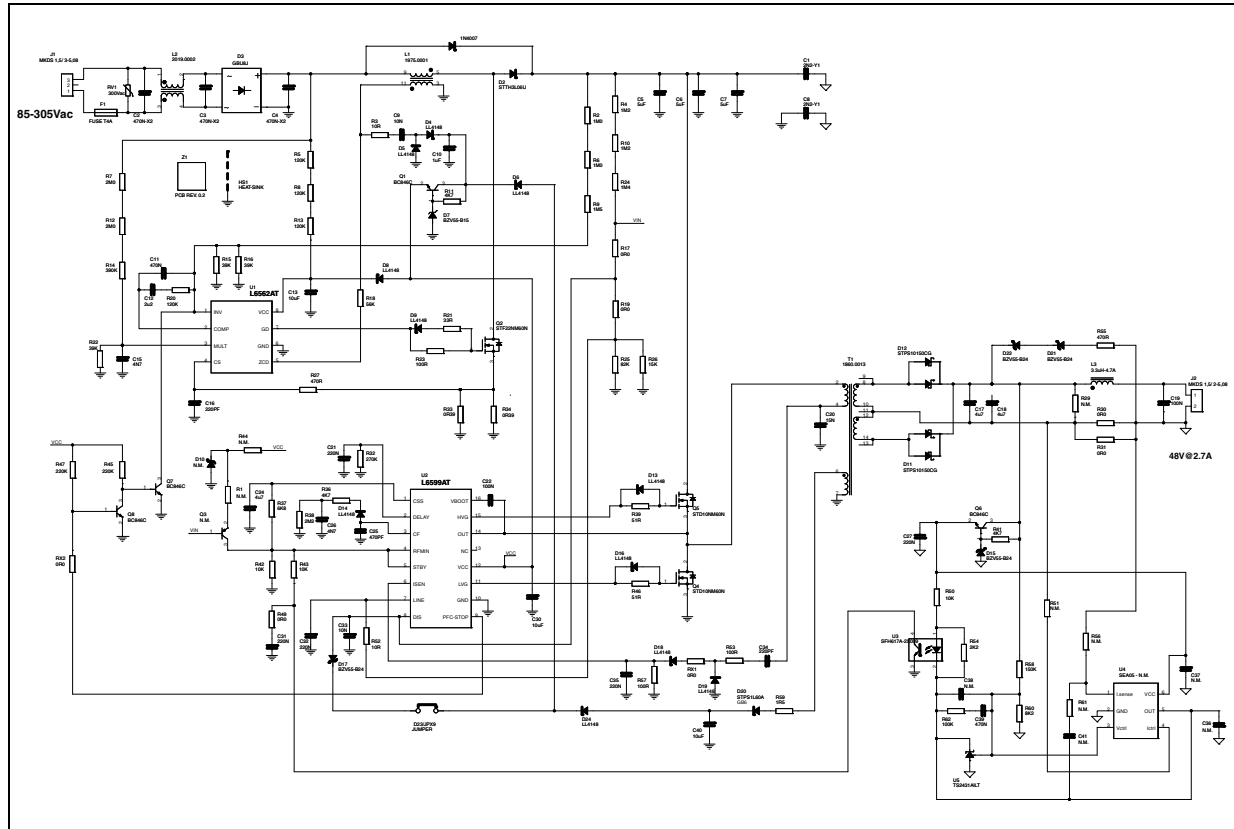


Thanks to the high efficiency achieved, just a small heatsink for the PFC stage is needed, while the other power components employ SMT (surface mount technology), like most of the passive components, thereby decreasing production labor cost.

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. |

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.

UNLESS EXPRESSLY APPROVED IN WRITING BY TWO AUTHORIZED ST REPRESENTATIVES, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.

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.

© 2012 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