NXP mains LED driver IC SSL1750

Highly efficient SMPS controller with integrated PFC for SSL

This SMPS controller IC, equipped with fly-back control and integrated PFC, delivers highly efficient, flexible operation in a small form factor, and is ideally suited for indoor and outdoor SSL applications above 25 W.

Features

- Operates from universal mains supply (80 to 276 VAC)
- Supporting the majority of the available dimmers (e.g. TRIAC, transistor)
- High-voltage start-up
- Integrated PFC
- Meets power requirements between 25 and ~ 250 W (PFC needed)
- High efficiency
- Accurate current control
- Very low external component count
- Small SO16 package

Applications

- Indoor SSL applications above 25 W
  - Spot lights
  - Down lights
  - Other consumer and industrial SSL fixtures
- Outdoor SSL applications above 25 W
  - Street lighting
  - Area lighting, such as parking lots
  - Tunnel lighting, including lighting tubes based on LED strings

The SSL1750, suitable for indoor and outdoor Solid State Lighting (SSL) applications above 25 W, is a highly integrated device that combines a controller for Power Factor Correction (PFC) with a fly-back controller.

The SSL1750 delivers very efficient power conversion from the universal mains. As a result, the IC generates less heat and thus maximizes efficiency. The very high level of integration reduces the number of external components and lowers overall cost.

Accurate current control through the LED's makes it possible to dim the lights for additional energy savings. This is particularly useful in outdoor applications, since it means that the lights used along streets, in tunnels, or around parking areas can be dimmed when no one is around.

The integrated PFC controller meets the required power factor and harmonic distortion regulations for applications above 25 W.

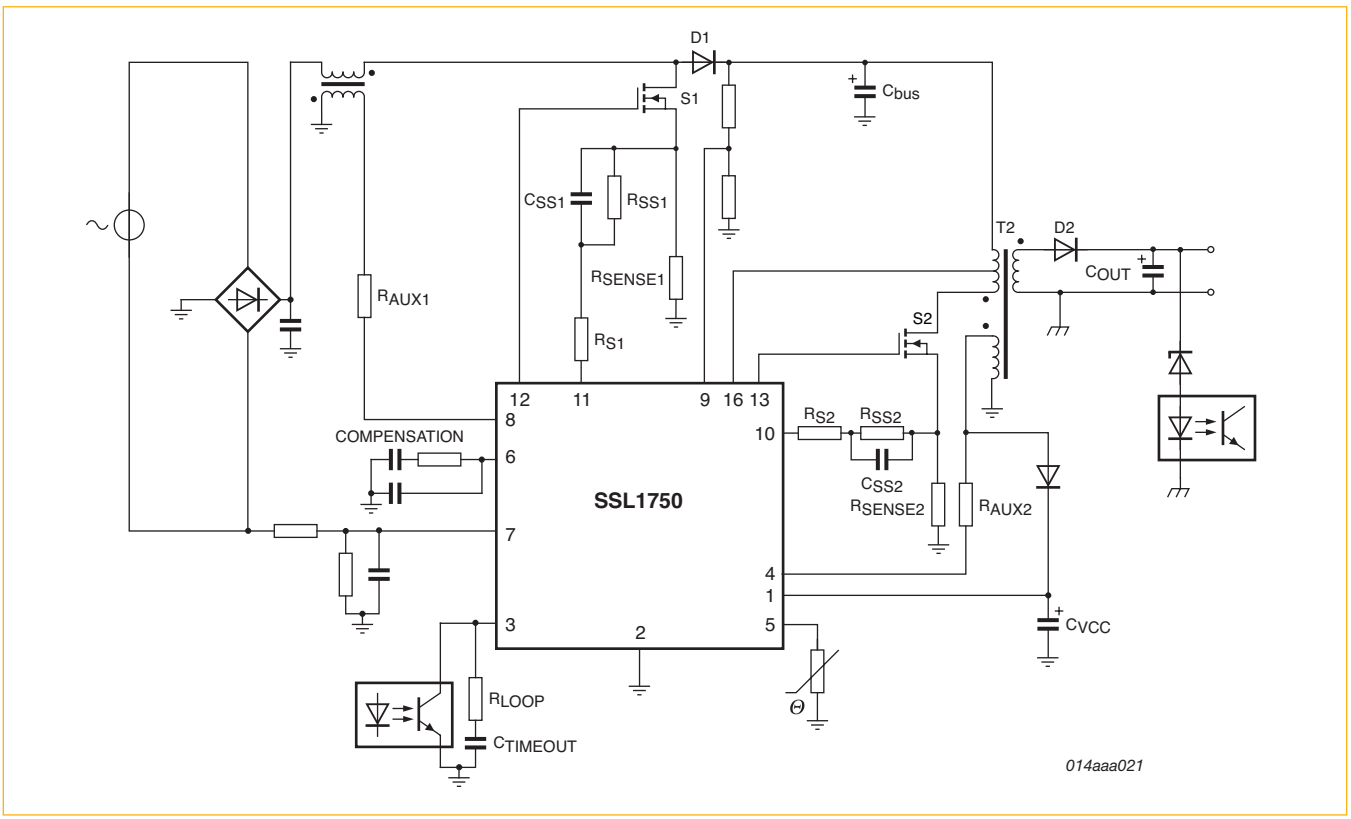
NXP founded by Philips

Several features support environmentally responsible design. Using the proprietary, high-voltage BCD800 process, the SSL1750 can provide direct start-up from the rectified universal mains voltage in an effective and green way. A second, low-voltage Silicon-on-Insulator (SOI) IC is used for accurate, high-speed protection functions and control.

A patented valley/zero-voltage switching scheme minimizes switching losses. Frequency limitation reduces switching losses even further. The IC also uses a patented technique for burst-mode operation if a low load is detected at the fly-back output.

The fly-back controller uses frequency reduction with fixed-minimum peak current during low-power operation, so it maintains high efficiency even at low-output power levels.

To ensure safe operation, the PFC and the fly-back controllers have under- and over-voltage protection, as well as over-current protection. Also, the IC itself is equipped with over-temperature alarms.



The SSL1750 shown in a lighting application

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