

HVLED805 – one-chip solution for LED driving



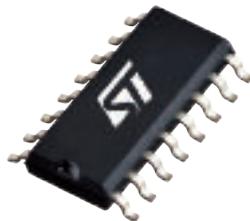
STMicroelectronics

The HVLED805 LED driver provides very accurate output current regulation using a primary sensing feedback

STMicroelectronics' HVLED805 is a current-mode IC designed for zero-voltage switching flyback LED drivers.

This IC combines a high-performance PWM controller chip and an 800 V avalanche-rugged power MOSFET in the same package.

The HVLED805 is intended to operate directly from the rectified mains with minimum external parts, providing an efficient, compact and cost-effective solution to drive LEDs.



Key features

- 5 % accuracy on constant LED output current with primary control
- Optocoupler not needed
- 800 V avalanche-rugged internal power MOSFET
- Quasi-resonant zero-voltage switching (ZVS) operation
- Internal high-voltage start-up
- Safe against open or shorted LED string
- Automatic self supply
- Input voltage feed-forward for mains independent constant-current regulation
- SO16N package

Main applications

- AC-DC LED drivers
- LED retrofit lamps (i.e. E27, GU10)

Key benefits

- Accurate primary-current control avoids the use of secondary sensing, reducing costs and complexity
- Internal power MOSFET high-voltage start-up allows compact applications
- Zero-voltage switching operation improves efficiency
- Reduced external part count allows very small form factors

A compact and efficient solution for LED driving

By combining a state-of-the-art low-voltage technology for the controller and an extremely robust 800 V technology for the power MOSFET in the same package, ST offers an efficient, compact and cost-effective solution to drive LEDs directly from the rectified mains. Its compactness makes the HVLED805 the perfect solution to fit into very space limited applications, such as incandescent bulb retrofits.

The PWM is a current-mode controller IC specifically designed for zero-voltage switching (ZVS) flyback LED drivers, with constant output current (CC) regulation using primary-sensing feedback. This eliminates the need for the secondary voltage reference, the optocoupler, as well as the current

sense on the secondary side, still maintaining a very good LED current accuracy. Moreover it guarantees safe operation when a short circuit of one or more LEDs occurs.

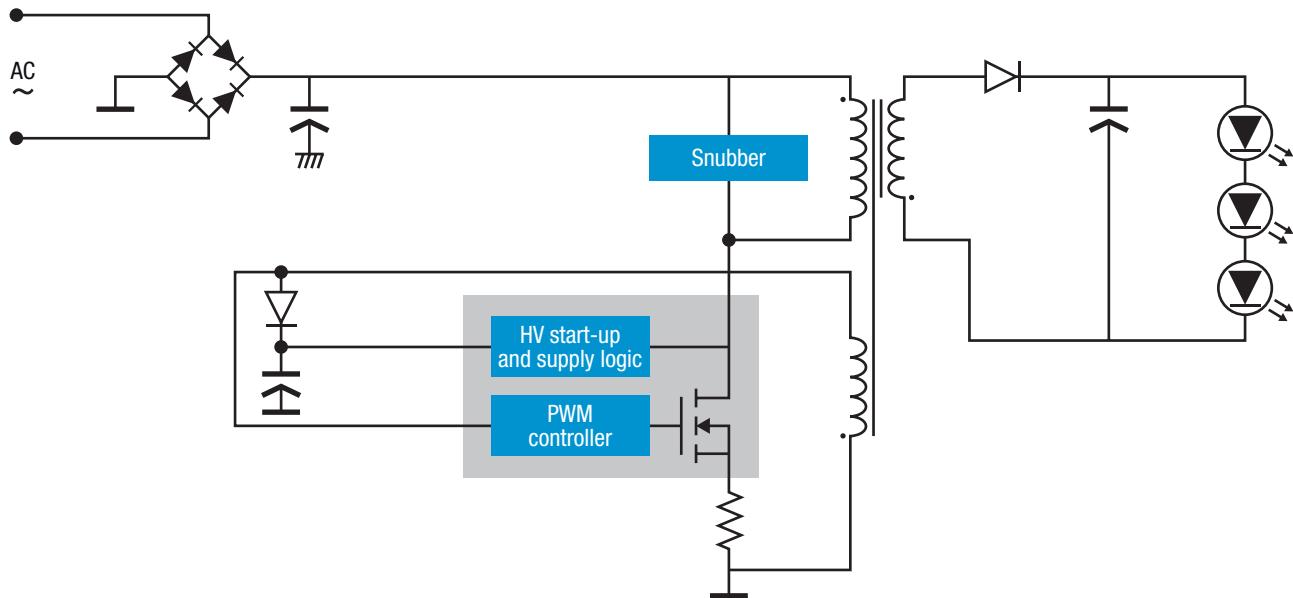
In addition, the device can also provide constant output voltage regulation (CV) that also protects the application in case of failure due to an open LED string.

The quasi-resonant ZVS operation is achieved by means of a transformer demagnetization sensing input that triggers the turn-on of the MOSFET. This input also serves both as an output voltage monitor, to perform CV regulation, and as an input voltage monitor, to achieve mains-independent CC regulation (line-voltage feed forward).

Although an auxiliary winding is required in the transformer to correctly perform CV/CC regulation, the chip is able to power itself directly from the rectified mains. This is particularly useful during CC regulation, where the flyback voltage generated by the winding drops.

In addition to these functions that optimize power handling under different operating conditions, the device offers protection features that considerably increase the end product's safety and reliability: auxiliary winding disconnection or brownout detection and shorted secondary rectifier or transformer saturation detection. All of them operate in auto-restart mode.

Application diagram



Evaluation board

Order code	Description
EVALHVLED805	Insulated LED driver with primary current control

