

# HVLED101

## Enhanced LED controller Lighting the future



### Advanced high power factor flyback controller with valley locking and maximum power control

The design of new generation mid- and high-power LED lighting is a relentless struggle for energy efficiency, reliability, and cost competitiveness with no compromise in light quality.

The HVLED101 embodies ST's expertise in power conversion and high-voltage silicon technologies, allowing to easily design high performance LED drivers, and to meet the most stringent regulations for power efficiency and quality.

#### KEY FEATURES & BENEFITS

- Programmable frequency foldback with valley locking for noise-free operation
- Programmable maximum input power limitation for compliance with safety standards
- 800 V fast high-voltage startup
- Patented THD optimizer for high power factor and low THD in universal and extended range:
  - THD < 5% @ full load
  - THD < 10% @ 1/3 load

#### KEY APPLICATIONS

LED applications up to 180 W in a single-stage configuration and 200 W in a two-stage configuration for:

- Professional lighting
- High-bay lighting fixtures
- Street-lighting solutions

## HVLED101

The HVLED101 is an enhanced peak current mode controller able to control mainly high power factor (HPF) flyback or buck-boost topologies having an output power up to 180 W.

The primary-side regulation of the output voltage and optocoupler control can be applied independently on the chip to ensure precise regulation and very low standby power consumption during no-load conditions.

ST's innovative high-voltage technology lets you directly connect the HVLED101 to the input voltage to start up the LED module and monitor the input voltage without the need for external components. Its integrated valley locking feature guarantees noise-free operation during medium- and low-load operation and its Maximum Power Control (MPC) feature limits the input power to a user-programmable level to increase converter safety.

ST's patented THD Optimizer embedded in the HVLED101 minimizes the distortion of the absorbed AC current (THD) and maximizes the power factor (PF) independently of the transformer setup (turn ratio and primary inductance).

The particular distortion method adopted for THD optimization, together with the valley locking technique, ensures a very high power factor at both full and intermediate loads.

The HVLED101's valley locking feature avoids random valley jumping, keeping the number of valley jumps constant until a significant modification of output power (or input voltage) is detected.

As a result, the input THD is minimized at intermediate load, audible noise is avoided, and output variable is smoothly regulated.

Its internal Maximum Power Control (MPC) function generates an internal reference value that is derived from the input voltage. This lets the topology absorb maximum power from an input source that is independent from the input voltage and input shape. At overload conditions, the HVLED101 does not take any action, but simply limits the power delivered to MPC level. The combination of the valley locking feature and the proprietary THD optimizer ensures a very low THD, less than 5% at full load and less than 10%, between 30% and 100% of the rated load.

## Evaluation Ecosystem

As a leading provider of complete lighting solutions with smart management and high protection levels, ST provides a range of evaluation boards for our innovative and cost-effective LED and general lighting solutions to simplify and speed up your design.



50 W converter based on HVLED101 quasi-resonant HPF flyback controller with primary-side regulation ([EVLHV101PSR50W](#))



50 W converter based on HVLED101 quasi-resonant HPF flyback controller with secondary-side regulation ([EVLHV101SSR50W](#))



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