

# HL9510SC06

## Offline AC-DC Primary Side PWM Controller for Flyback Converter

### Overview

The HL9510 is a Flyback PWM controller, which operates in a quasi-resonant (QR) mode and continuous conduction mode (CCM), to significantly enhance system efficiency and power density. The control method is based on load conditions: for heavy load, the valley switching with fixed blanking time is applied; and for medium load, the valley switching with variable blanking time is applied to optimize efficiency. In addition, it offers constant output voltage (CV) regulation through opto-coupler feedback controller with shunt regulator and integrates HV startup. The brown-in voltage is programmed by external DMAG pin resistor.

Wide VDD operating range can be allowed for variable output mode applications, such as USB-PD/PPS or conventional DP/DN protocol communication. The controller provides stable gate voltage to drive external power switch thru VREG pin.

The HL9510 has protections, such as  $V_{DD}$  over-voltage protection ( $V_{DD}$  OVP),  $V_{DMAG}$  over-voltage protection ( $V_{DMAG}$  OVP),  $V_{DMAG}$  under-voltage protection ( $V_{DMAG}$  UVP), internal over-temperature protection (OTP), brown-out protection, and externally triggered shut-down (SD) function for safety.

### Features

- High average efficiency by QR and CCM switching operation
- Wide VDD operating ranges up to 80V
- Smart driver and frequency hopping for better EMI performance
- GaN Driver compatible
- mWSaver® Technology for ultra-Low standby power consumption (<20mW)
- Integrated over-voltage protection (OVP), under-voltage protection (UVP), and over-temperature protection (OTP).
- Programmable thermal shunt down protection through external NTC (SD)
- Programmable brown-in protection and brown-out protection
- Integrated high-voltage (HV) startup to reduce external components
- Limit power source (LPS) with adaptive constant current protection (CC)
- Cycle by cycle current pulse limit (VCS\_LIM)
- Current sense short circuit protection (CSSP)
- Secondary side diode short protection (SSSP)
- Accurate protection behavior for auto-restart, latch, and long auto-restart mode

### Applications

- Battery Chargers for Smartphones and Tablet PCs
- Adapters for Portable Devices
- Flyback Power Supplies with Low and/or Variable Output Voltage

## Simplified Application Diagram

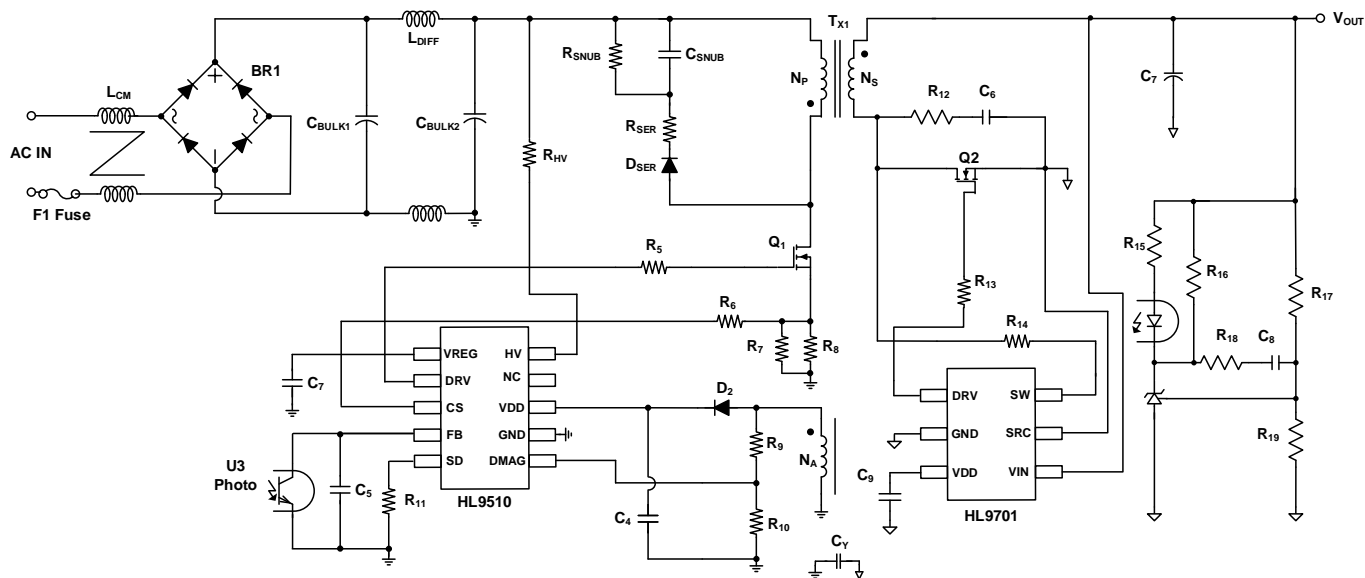


Figure: HL9510 Simplified Application Diagram

## Ordering Information

| Part Number | Operating Temperature Range | Package       | Packing Method |
|-------------|-----------------------------|---------------|----------------|
| HL9510SC06  | -40°C to +125°C             | 10-Lead, SOIC | 4K/Tape & Reel |

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