Flyback PWM Controllers Enable Small Footprints For Fast Charging Solutions

Elevation Semiconductor's HL9510 and HL9512 flyback PWM controller ICs are high-efficiency power ICs with smaller footprints for fast-charging solutions. These controllers operate in a quasi-resonant (QR) mode to significantly enhance the system efficiency and power density. Both ICs offer constant-output voltage regulation through the optocoupler feedback controller or shunt regulator and integrate high-voltage startup (see the figure).

The chips' numerous forms of protection include VDD overvoltage protection (VDD-OVP), brownout protection, DMAG overvoltage protection (DMAG-OVP), DMAG undervoltage protection (DMAG-UVP), IC internal overtemperature protection (OTP), and IC external thermal shutdown (SD). The brown-in voltage is programmed by an external DMAG pin resistor and has a wide VDD operating range to cover variable output mode applications, such as USB-PD/PPS or conventional DP/DN protocol communication.

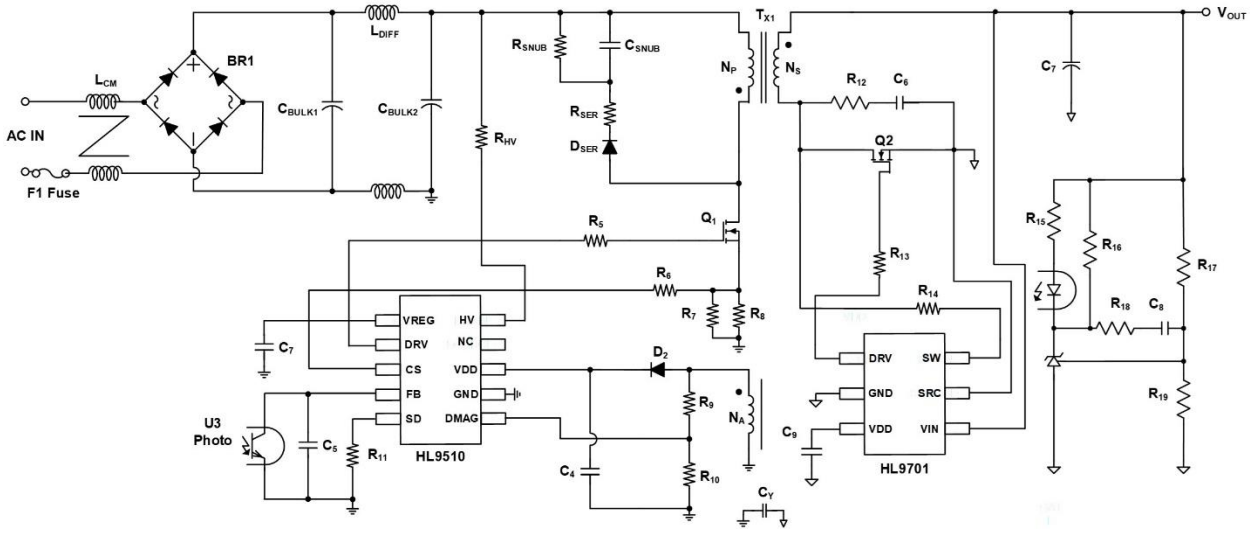
Its protection is also implemented with auto-restart mode. The VDD-OVP, DMAG-OVP, and external SD protection can be configured with auto-restart or latch mode, and the DMAG-UVP can be configured with auto-restart or long auto-restart mode.

The HL9510 is designed to integrate an internal HV startup circuit, whereas the HL9512 can accomplish the same function using an external MOSFET combined with the IC's AUX and ST pins. The HL9510 is described as GaN driver compatible, while the HL9512 is MOSFET compatible.

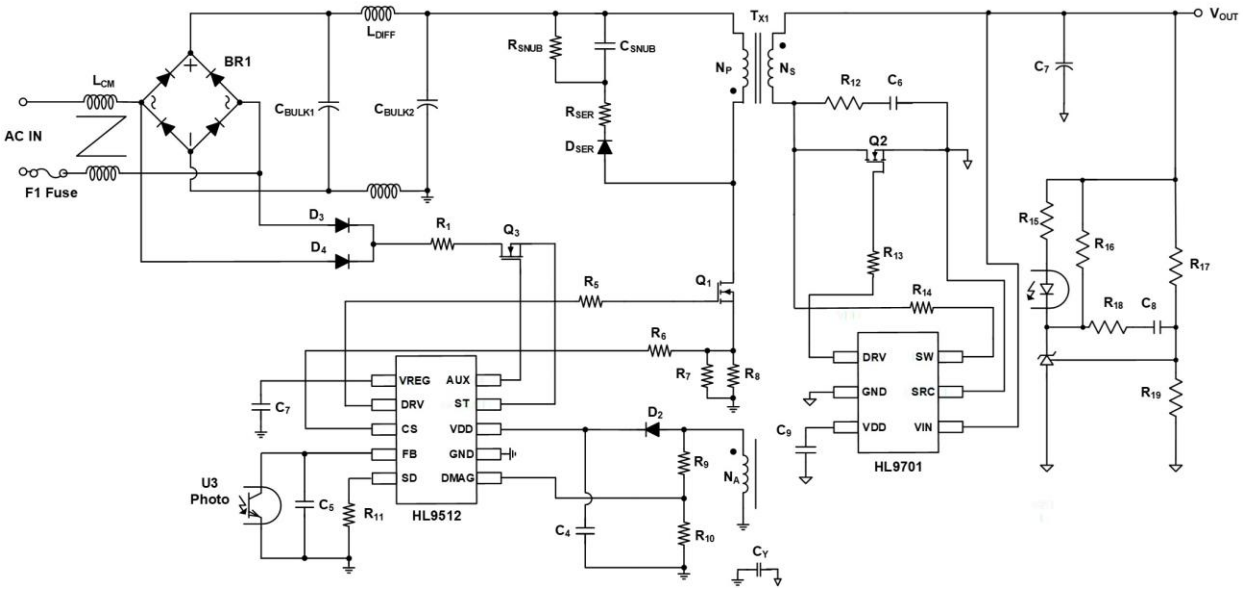
The HL9510 is available in a 10-lead SOIC package well suited for USB PD/QC portable device battery chargers, high-efficiency ac-dc power adapters, and a power supply with fixed or variable output voltage. The HL9512 also comes in the same package and is well suited for smartphones, tablet PC battery chargers, portable device adapters, and flyback power suppliers with low and/or variable output voltage.

"The new flyback PWM controllers add another dimension to our fast-charging solutions portfolio with their enhanced system efficiency and power density. Their smaller footprint also plays a critical role in key applications with limited board space," said David Nam, CEO of Elevation Semiconductor.

The HL9510 and HL9512 are offered in 10-lead SOIC packages. For more information, see the website or email sales@elevationsemiconductor.com.



(a)



(b)

Figure. Application circuits for the HL9510 (a) and HL9510 (b). The HL9510 is a flyback PWM controller, which operates in a quasi-resonant (QR) and continuous conduction mode (CCM), to significantly enhance system efficiency and power density. The control method is based on load conditions: for heavy load, valley switching with fixed blanking time is applied; and for medium load, valley switching with variable blanking time is applied to optimize efficiency. In addition, it offers constant output voltage (CV) regulation through optocoupler feedback controller with shunt regulator and integrated HV startup. The HL9512 flyback PWM controller is similar to the HL9510. But whereas the HL9510 has integrated high-voltage startup to reduce external components, the HL9512 uses an external depletion-mode MOSFET for startup.