



G5199

Off-Line Digital Green-Mode Quasi-Resonant PWM Controller

DIGITAL PWM IC

1.0 General Description

The G5199 is a high performance AC/DC power supply controller which uses digital control technology to build peak current mode PWM flyback power supplies. The device operates in quasi-resonant mode to provide high efficiency along with a number of key built-in protection features while minimizing the external component count, simplifying EMI design and lowering the total bill of material cost. The G5199 removes the need for secondary feedback circuit while achieving excellent line and load regulation. It also eliminates the need for loop compensation components while maintaining stability over all operating conditions. Pulse-by-pulse waveform analysis allows for a loop response that is much faster than traditional solutions, resulting in improved dynamic load response for both one-time and repetitive load transients. The built-in power limit function enables optimized transformer design in universal off-line applications and allows for a wide input voltage range. GlobalSemi's innovative proprietary technology ensures that power supplies built with the G5199 can achieve both highest average active efficiency and less than 30 mW no-load power consumption, and have fast dynamic load response in a compact form factor in typical 12 W and above applications. The active start-up scheme enables shortest possible start-up time without sacrificing no-load power loss.

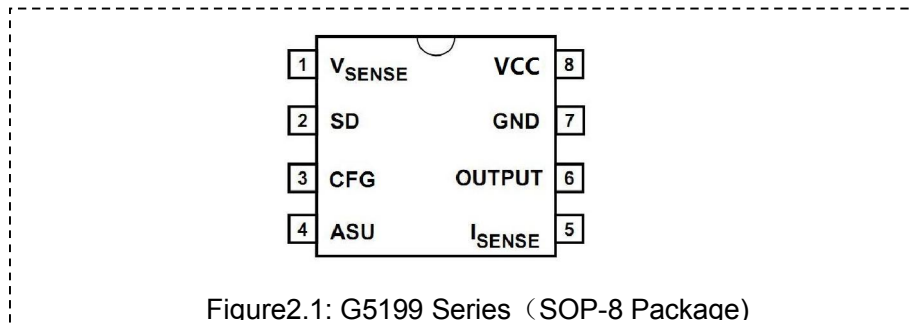
Features

- ◆ No-load power consumption < 30 mW at 230 VAC along with fast dynamic load response and short turn-on delay time in typical 12 W compact adapter/charger applications
- ◆ Tight constant-voltage and constant-current regulation across line and load range
- ◆ Primary-side feedback eliminates opto-isolators and simplifies design
- ◆ Proprietary optimized 90 kHz maximum PWM switching frequency with quasi-resonant operation achieves best size, efficiency and common mode noise
- ◆ User-configurable 5-level cable drop compensation provides design flexibility
- ◆ Adaptive Multi-mode PWM/PFM control improves efficiency
- ◆ No external loop compensation components required
- ◆ Complies with EPA 2.0 energy-efficiency specifications with ample margin
- ◆ Built-in single-point fault protection features: output short-circuit protection, output over-voltage protection, over-current protection and current-sense-resistor fault protection
- ◆ Dedicated pins for external over-temperature protection and over-voltage protection
- ◆ No audible noise over entire operating range

Applications

- Compact AC/DC adapter/chargers for media tablets and smart phones
- AC/DC adapters for consumer electronics



2.0 Products Information**2.1 Pin configuration**

| Pin# | Name | I/O | Description |
|------|--------------------|--------------|--|
| 1 | V _{SENSE} | Analog Input | Auxiliary voltage sense (used for primary regulation). |
| 2 | SD | Analog Input | External shutdown control. Used for external over-temperature protection (OTP) by connecting an NTC resistor from this pin to Ground. |
| 3 | CFG | Analog Input | Shared Multi-function pin. Used for external cable drop compensation (CDC) configuration and supplemental over-voltage protection (OVP). |
| 4 | ASU | Output | Control signal for active start-up device (BJT or depletion mode NFET). |
| 5 | I _{SENSE} | Analog Input | Primary current sense. Used for cycle-by-cycle peak current control and limit. |
| 6 | OUTPUT | Output | Gate drive for external MOSFET switch. |
| 7 | GND | Ground | Ground. |
| 8 | VCC | Power Input | Power supply for control logic. |