PSR/SSR Mixed PWM Controller Provides Ultra-Low Standby Power for Portable Device Chargers

Cell phone chargers typically sit plugged in and unused most of the time. Yet, they still draw power from the grid, wasting energy and the consumer's money. The problem facing design engineers is clear – how can standby power be reduced in these devices, thereby saving energy, meeting government regulations and saving the consumer money?

To help designers meet this challenge, Fairchild Semiconductor developed the FAN302HL PWM controller for low standby power charger applications. Incorporating mWSaver™ technology, the device features patented technologies that allow the FAN302HL to minimize standby input power consumption to
This highly integrated PWM controller provides several features to enhance the performance of general flyback converters. Integrating a 500V JFET, the FAN302HL allows the device to cut off the current path after the device is turned on, reducing start-up losses. The patented constant current control topology enables simplified circuit design without secondary constant current feedback circuitry, especially important in battery charger applications.

The FAN302HL also provides several protection features. These include cycle-to-cycle current limiting to ensure a fixed peak current limit level, even if a short circuit occurs. Additionally, the gate output is also clamped at 15V to protect the power MOSFET from high gate-source voltage damages.

The FAN302HL does not require an external secondary-side over-voltage protection (OVP) circuit. If either VS pin OVP or internal over-temperature protection is triggered, the device enters latch mode until AC power is removed, saving second side OVP components and tightening VO protection (
Innovative technology reduces numerous losses in both the power MOSFET and the PWM IC. Primary side regulation control for constant current and no second side current sensing provides lower losses and improved efficiency. Proprietary burst mode operation, with lower operation current, minimizes the standby power consumption.

Additionally, the FAN302HL uses secondary-side regulation for constant voltage with good dynamic response, meeting USB 2.0 specifications. By using the FAN302HL, a charger can be implemented with fewer external components, minimizing cost when compared to conventional designs or a linear transformer.

In addition to cell phone chargers, the FAN302HL is ideal for applications such as smartphones, cordless phones, DVD/Set-Top Boxes, Power Over Ethernet and small appliances.

The FAN302HL, available in an 8-pin, small outline package, offers a fixed PWM frequency at 85 kHz with frequency hopping to reduce EMI.

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