September 2015

FAN7530 Critical Conduction Mode PFC Controller

Features

- Low Total Harmonic Distortion (THD)
- Precise Adjustable Output Over-Voltage Protection
- Open-Feedback Protection and Disable Function
- Zero Current Detector
- 150µs Internal Start-up Timer
- MOSFET Over-Current Protection
- Under-Voltage Lockout with 3.5V Hysteresis
- Low Start-up (40µA) and Operating Current (1.5mA)
- Totem Pole Output with High State Clamp
- +500/-800mA Peak Gate Drive Current
- 8-pin DIP or 8-pin SOP

Applications

- Adapter
- Ballast
- LCD TV, CRT TV
- SMPS

Related Application Notes

- ***AN-6027*** - Design of Power Factor Correction Circuit Using FAN7530

Description

The FAN7530 is an active power factor correction (PFC) controller for the boost PFC applications that operates in critical conduction mode (CRM). It uses the voltage mode PWM that compares an internal ramp signal with the error amplifier output to generate MOSFET turn-off signal. Because the voltage mode CRM PFC controller does not need the rectified AC line voltage information, it can save the power loss of the input voltage sensing network necessary for the current mode CRM PFC controller.

FAN7530 provides many protection functions such as over voltage protection, open-feedback protection, over-current protection, and under-voltage lockout protection. The FAN7530 can be disabled if the INV pin voltage is lower than 0.45V and the operating current decreases to 65µA. Using a new variable on-time control method, THD is lower than the conventional CRM boost PFC ICs.

Ordering Information

Part Number	Operating Temp. Range	Pb-Free	Package	Packing Method	Marking Code
FAN7530N	-40°C to +125°C	Yes	8-DIP	Rail	FAN7530
FAN7530M	-40°C to +125°C	Yes	8-SOP	Rail	FAN7530
FAN7530MX	-40°C to +125°C	Yes	8-SOP	Tape & Reel	FAN7530

Pin Assignments

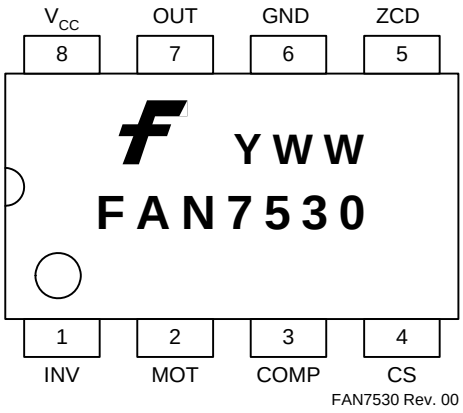

Figure 3. Pin Configuration (Top View)

Pin Definitions

Pin #	Name	Description
1	INV	This pin is the inverting input of the error amplifier. The output voltage of the boost PFC converter should be resistively divided to 2.5V.
2	MOT	This pin is used to set the slope of the internal ramp. The voltage of this pin is maintained at 3V. If a resistor is connected between this pin and GND, current flows out of the pin and the slope of the internal ramp is proportional to this current.
3	COMP	This pin is the output of the transconductance error amplifier. Components for the output voltage compensation should be connected between this pin and GND.
4	CS	This pin is the input of the over-current protection comparator. The MOSFET current is sensed using a sensing resistor and the resulting voltage is applied to this pin. An internal RC filter is included to filter switching noise.
5	ZCD	This pin is the input of the zero current detection block. If the voltage of this pin goes higher than 1.5V, then goes lower than 1.4V, the MOSFET is turned on.
6	GND	This pin is used for the ground potential of all the pins. For proper operation, the signal ground and the power ground should be separated.
7	OUT	This pin is the gate drive output. The peak sourcing and sinking current levels are +500mA and -800mA respectively. For proper operation, the stray inductance in the gate driving path must be minimized.
8	V_{CC}	This pin is the IC supply pin. IC current and MOSFET drive current are supplied using this pin.