FAIRCHILD SEMICONDUCTOR

July 2013

FAN7340
LED Backlight Driving Boost Switch

Features

- Single-Channel Boost LED Switch
- Internal Power MOSFET for PWM Dimming: $R_{DS(on)}$ = 3.4 Ω at V_{GS}=10 V, BV_{DSS}=400 V
- Current Mode PWM Control
- Internal Programmable Slope Compensation
- Wide Supply Voltage Range: 10 V to 35 V
- LED Current Regulation: ±1%
- Programmable Switching Frequency
- Analog and PWM Dimming
- Wide Dimming Ratio: On Time=10 µs to DC
- Cycle-by-Cycle Current Limiting
- Thermal Shutdown: 150°C
- Open-LED Protection (OLP)
- Over-Voltage Protection (OVP)
- Over-Current Protection (OCP)
- Error Flag Generation (for External Load Switch)
- Internal Soft-Start
- 16-Lead SOIC Package

Applications

- LED Backlight for LCD TV
- LED Backlight for LCD Monitor
- LED Lighting

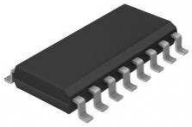
Description

The FAN7340 is a single-channel boost controller that integrates an N-channel power MOSFET for PWM dimming using Fairchild's proprietary planar Double-diffused MOS (DMOS) technology.

The IC operates as a constant-current source for driving high-current LEDs.

It uses Current Mode control with programmable slope compensation to prevent subharmonic oscillation. The IC provides protections including: open-LED protection, over-voltage protection, and direct-short protection for high system reliability.

The IC internally generates a FAULT signal with delay if an abnormal LED string condition occurs. PWM dimming and analog dimming functions can be implemented independently. Internal soft-start prevents inrush current flowing into output capacitor at startup.



Ordering Information

Part Number	Operating Temperature Range	Package	Packaging Method
FAN7340MX	-40°C to +125°C	16-Lead, Small-Outline Integrated Circuit (SOIC)	Tape & Reel

Block Diagram

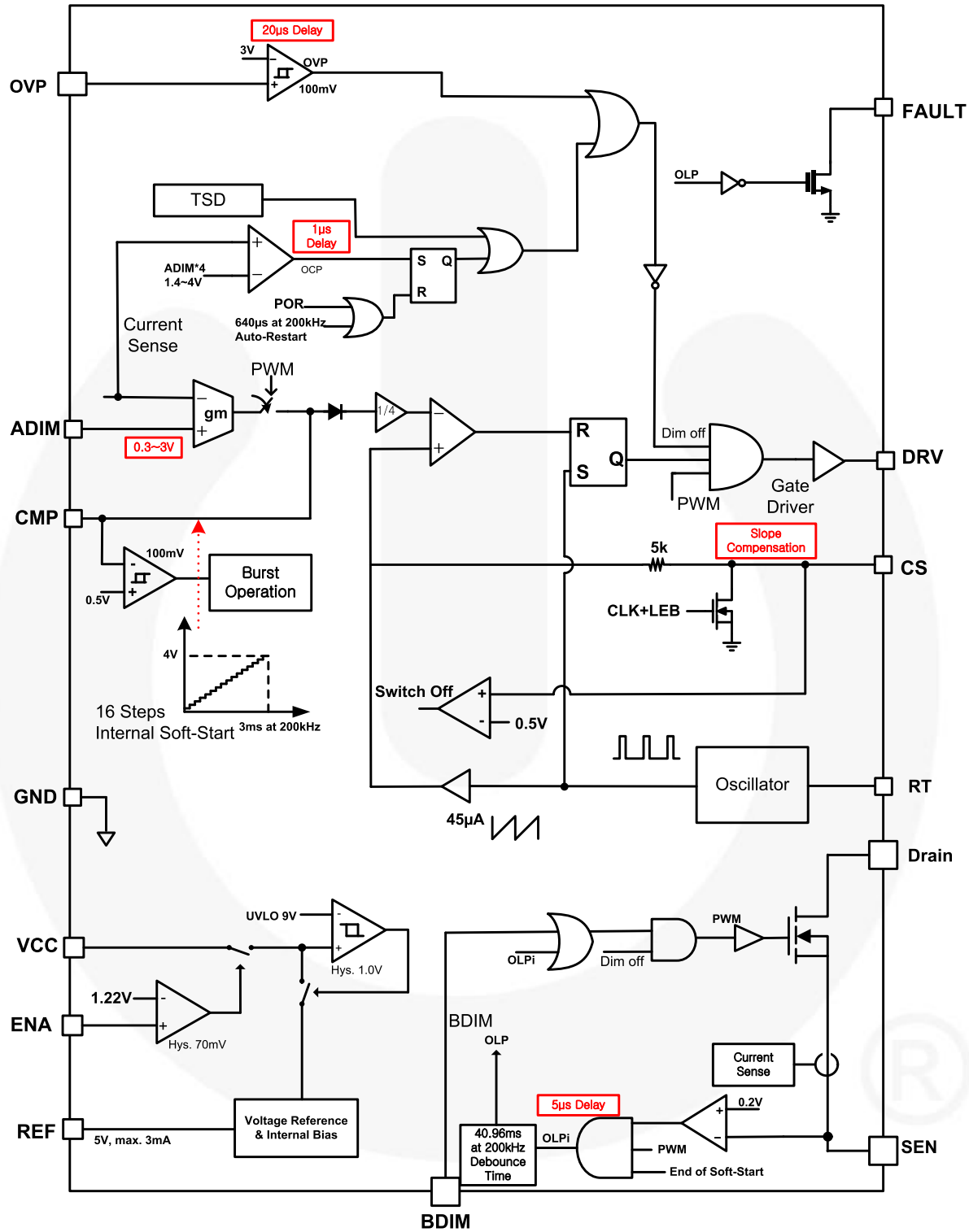


Figure 1. Internal Block Diagram

Pin Assignments

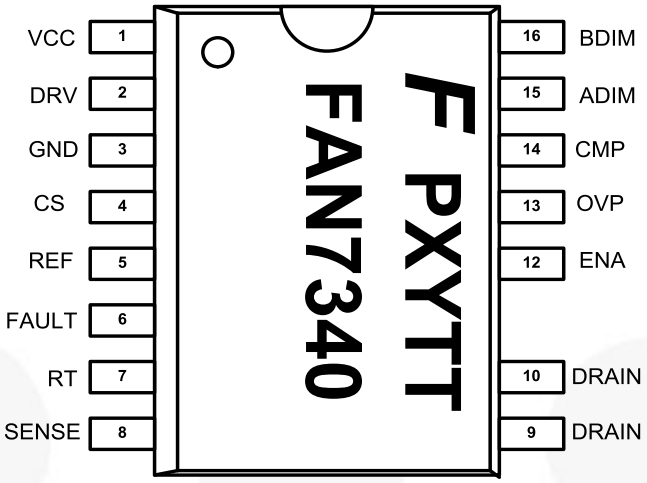


Figure 2. Package Diagram

Pin Definitions

Pin #	Name	Description
1	VCC	This pin is the supply voltage of the IC.
2	DRV	This pin is the gate drive signal of the boost switch.
3	GND	This pin is the ground of the IC.
4	CS	This pin is for sensing the current flowing through an external MOSFET. It includes a built-in 300 ns blanking time. The peak of the current flowing through the MOSFET is limited to this pin voltage. Slope compensation of the boost controller can be programmed through the series resistor of this pin.
5	REF	This pin is the 5 V reference voltage pin. Maximum current capability is 3 mA.
6	FAULT	This pin is for indicating the fault signal. This pin is connected to the open drain. When OLP protection is occurred, the FAULT pin is pulled HIGH.
7	RT	Oscillator frequency set of the boost switch (50 kHz ~ 300 kHz).
8	SENSE	This pin is for sensing the current flowing through the LEDs. A sensing resistor is connected from this pin to ground. This pin is connected to the negative input of the internal error amplifier.
9, 10	DRAIN	Drain pin of PWM dimming power MOSFET.
12	ENA	Enable input pin. If voltage of this pin is higher than 1.22 V, IC is starting to operate. If the voltage of this pin is lower than 1.15 V, the IC stops operating.
13	OVP	Over-voltage protection input pin. Output voltage of the boost circuit is connected to this pin through a resistor divider circuit. If this pin voltage is higher than 3 V, OVP is triggered.
14	CMP	This pin is the error amplifier output. Typically, a compensation capacitor and resistor are connected to this pin from the ground.
15	ADIM	This pin is for setting the current flowing through the LEDs. This pin is connected to the positive inputs of the internal error amplifier. Linear voltage range of ADIM is 0.3 V~3.0 V.
16	BDIM	This pin is for the burst dimming signal. If this pin voltage is HIGH, the internal dimming MOSFET is turned on. If this pin voltage is LOW, the dimming MOSFET is turned off.

Note:
1. Pin 11 is a “No Connect” pin (not shown in Figure 2).