

White LED Driver IC

Features

- ▶ Power efficiency of up to 85%
- ▶ Drives up to six white LEDs
- ▶ 2.6 - 4.6V supply power stage can operate at 1.8V (see page 7)
- ▶ Built-in soft start
- ▶ DC and PWM dimming control
- ▶ Built-in open LED protection
- ▶ Open LED indicator (via R_{SET})
- ▶ 1.2MHz fixed switching frequency
- ▶ 500nA max leakage current when disabled
- ▶ No leakage current path through LEDs when disabled
- ▶ Resistor-programmable LED current
- ▶ Small 6-Lead DFN (3.00mm x 3.00mm) package

Applications

- ▶ Color LCD backlighting
- ▶ Cell phones, smart phones
- ▶ PDAs, pocket PCs
- ▶ Organizers
- ▶ Digital cameras
- ▶ MP3 players

General Description

The Supertex HV9903 is a fixed frequency DC-DC boost converter designed for driving Light Emitting Diodes (LEDs) with constant current where the light intensity is proportional to the current through them. The input supply voltage range into the device (V_{DD}) is 2.6 - 4.6V. Operation of the driver at lower voltages is possible as long as a 2.6 - 4.6V low-current supply is available for the HV9903. The device uses a single inductor and a minimum number of passive components. The device can be enabled/disabled via the $\overline{\text{SHDN}}$ pin.

The HV9903 has an internal oscillator. The oscillator is at fixed frequency of 1.2MHz that allows use of small value inductors. The LED current can be adjusted from 5.0 - 40mA by an external resistor connected between the RSET and the GND pins. The amount of current through the LED can also be adjusted via DC voltage or a pulse width modulated (PWM) signal to the RSET pin.

Soft-start is implemented on-chip, minimizing inrush current to only 30% over steady state current.

An open LED circuit detects an open LED condition, disables the driver, and sets the RSET pin high. The driver is re-enabled by asserting $\overline{\text{SHDN}}$ low, then high. If the open LED condition persists, the driver will again latch off.

Typical Application Circuit

