

BASIC CIRCUITRY METHOD AND FEATURES

WHITE LED DRIVERS

1. Boost regulator Type [using coil]

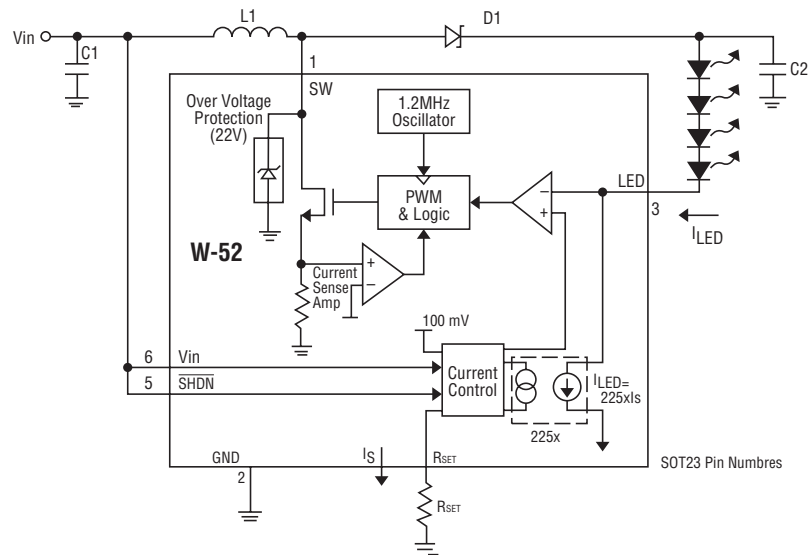


Figure 1: W-52 Block Diagram

FEATURES

- Designed for driving LEDs in series configuration
- High output voltage, high efficiency (over 80%)

Circuitry structure and operation

This will be explained by using W-52 as an example.

It is composed of a PWM modulator for activating switch transistor SW and a oscillator which are inside the IC, as well as current sensor circuitry Current Control and error amplifier for detecting the current flowing through the LED and diode Over Voltage Protection for guarding against excessive voltage.

It operates by setting the LED current (5mA to 40mA) to 225 times the current flowing through the R_{SET} pin. An error signal travels to the PWM modulator so that the current flowing through the LED connected to the output equalizes with the set value, and the switching circuitry, comprised of an external inductor and switch transistor, varies within an ON/OFF range and regulates the (PWM) output current in order to provide a constant amount of current. In irregular circumstances, such as when the output terminal is open, a diode guarding against excessive voltage will prevent the voltage from rising and protect the circuitry.

2. Charge pump regulator Type [using condenser]

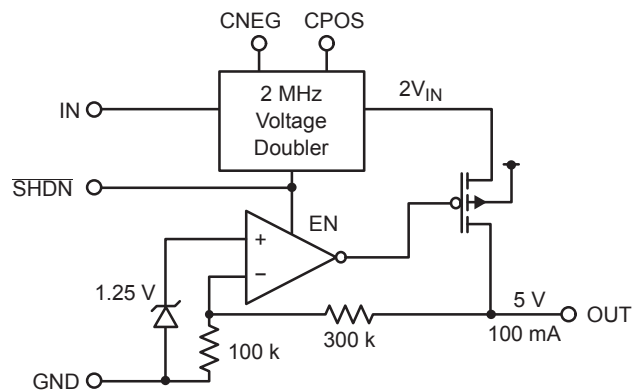


Figure 2

■ FEATURES

- Designed for driving LEDs in parallel configuration
- Low noise

■ Circuitry structure and operation

The W-5200-5 uses a switched capacitor charge pump to boost the voltage at IN to a regulated output voltage. Regulation is achieved by sensing the output voltage through an internal resistor divider and modulating the charge pump output current based on the error signal. A 2-phase non-overlapping clock activates the charge pump switches. The external flying capacitor is charged from the IN voltage on the first phase of the clock. On the second phase of the clock it is stacked in series with the input voltage and connected to OUT. The charging and discharging of the flying capacitor continues at a free running frequency of typically 2 MHz.