L4960 DC-DC CONVERTER

Adjustable Switching Power Supply 5.1V-40V 2.5A using L4960 + PCB

In this article, we present an adjustable power supply with a stabilized output that varies from **5.1** to **40V**, with a current of **2.5 amps**.

This one can also have its stabilized voltage fixed, everything will depend on the type of project you are going to use.

The adjustable power supply is based on **IC L4960** which is a monolithic power switching regulator **IC**, delivering **2.5A** at a voltage variable from **5V** to **40V** in step down configuration.

Features of device include current limiting, soft start, thermal protection and **0** to **100%** duty cycle for continuous operation mode.

CIRCUIT OPERATION

The **L4960** is a monolithic step down switching regulator providing output voltages from **5.1V** to **40V** and delivering **2.5A**.

The regulation loop consists of a sawtooth oscillator, error amplifier, comparator and output stage. An error signal is produced by comparing the output voltage with a precise **5.1V** on-chip reference (zener zap trimmed to ± **2%**).

This error signal is then compared with the sawtooth signal to generate a fixed frequency pulse width modulated pulses which drive the output stage.

The gain and frequency stability of loop can be adjusted by an external **RC** network connected to **pin 3.**

Closing loop directly gives an output voltage of **5.1V**. Higher voltages are obtained by inserting a voltage divider.

Output overcurrent at switch on are prevented by the soft start function. The error amplifier output is initially clamped by the external capacitor **Css** and allowed to rise, linearly, as this capacitor is charged by a constant current source. Output overload protection is provided in the form of a current limiter.

The load current is sensed by an internal metal resistor connected to a comparator. When the load current exceeds a preset threshold this comparator sets a **flip flop** which disables the output stage and discharges the soft start capacitor.

A second comparator resets the flip flop when the voltage across the soft start capacitor has fallen to **0.4V**.

The output stage is thus re-enabled and output voltage rises under control of the soft start network.

If the overload condition is still present, the limiter will trigger again when the threshold current is reached. The average short circuit current is limited to a safe value by the dead time introduced by the soft start network.

The thermal overload circuit disables circuit operation when the junction temperature reaches about **150°C** and has hysteresis to prevent unstable conditions.

Efficient operation at switching frequencies up to **150KHz** allows a reduction in the size and cost of external filter components.

The **L4960** is mounted in a plastic *Heptawatt* power pack, and pinouts are shown in ***Figure 3*** below.