DC267 Introduction

Description

Demo Board DC267 features the LTC1735CGN-1 in a circuit designed for mobile CPU applications with power good monitoring. The board provides a high efficiency step-down DC/DC converter with 1.3V or 1.5V output at 12A. The output voltage is logic level selectable via the Vsel terminal. A high logic level on the Vsel terminal selects the 1.5V output. Other output voltages in the range from 0.8V to 7V can be obtained by changing the voltage feedback resistor network (R1, R2 and R3). Also, the LTC1735-1 provides a power good monitoring function, which makes it ideal for CPU power applications. The board operates over the input voltage range of 4.5V to 24V or 2–4 Li-Ion cells.

The DC267 board is designed to emphasize the small size of implementation, which is ideal for mobile CPU applications. Output currents greater than 12A can be obtained by changing the MOSFETS, output inductor and current sense resistor. Lower currents are possible as well. For currents below 5A, a dual MOSFET in a single SO-8 package could be used; however, DC267 will only accept single MOSFETS in the SO-8 package.

Quick Start Guide

It is easy to set up DC267 to evaluate the LTC1735CGN-1 under different load and line conditions. Follow the procedure outlined below and refer to Figure 1 for proper setup.

1. Before turning on the power, connect the input power source, output load and meters as shown in Figure 1. It is important to use good quality digital multimeters, preferably true RMS types. Connect the voltmeters directly to the terminals on the demo board. Connecting the voltmeters elsewhere may result in significant measurement errors.

2. Before turning on the input power source, make sure that the output voltage adjustment is set to less that the 24V maximum.

3. Ensure that the output load is not shorted or set to more than 12A maximum. If you are using an electronic load, be aware that some loads demand higher currents at startup. This is because the internal current loop regulator amplifier is in saturation just prior to applying the input voltage. The internal current loop is trying to regulate the current (which is 0A prior to applying input) and is at its peak current setting. Until the preset current is reached, the electronic load will present such a low impedance that DC267 may not be able to raise the voltage into regulation. In this case use resistive loads instead, or set the electronic load current setting to < 12A until the converter has started.

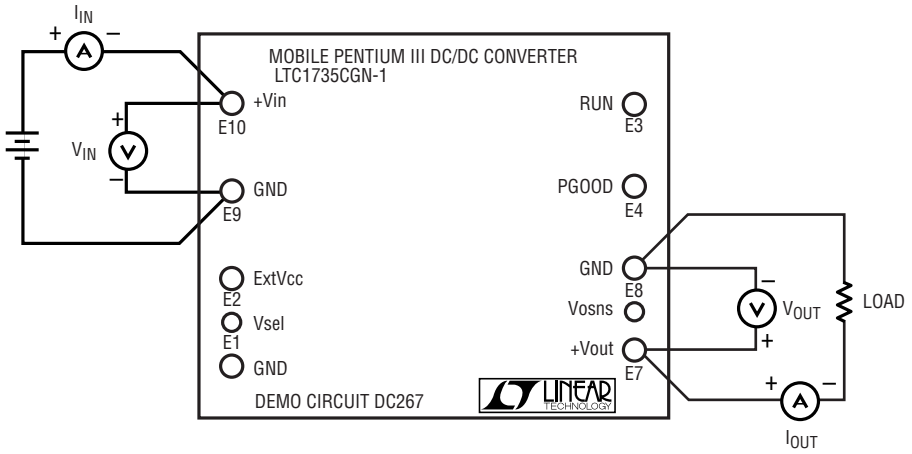

Figure 1. DC267 Test and Measurement Setup

4. Turn on the input power source. The output voltage should come up and the converter should be in full regulation. The full 12A output current will be available as soon as the output voltage has reached 70% of the regulated value.

5. The output ripple voltage can be measured with an oscilloscope at the output terminals. The most accurate measurements require that the scope probe tip sleeve be removed. The ground shield is placed against the ground terminal, with the probe tip touching the VOUT terminal, as shown in Figure 2. (Note: take care to avoid shorting the ground shield to the Vosns terminal, as shown in the figure.) The resulting ripple voltage will have a switching frequency sawtooth waveform that is < 50mV_{P-P} and voltage spikes at each MOSFET turn-on and turn-off. These spikes are normal and do not have very high energy content. Small decoupling capacitors at the load circuit are usually sufficient to completely suppress the high frequency spikes.

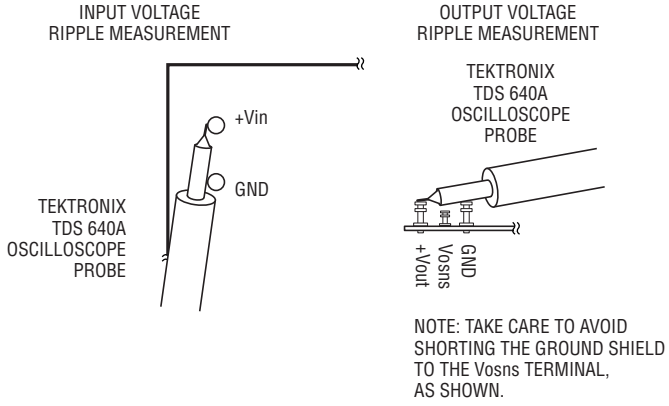

Figure 2. Oscilloscope Probe Technique for Measuring Input and Output Ripple