DC226A Quick Start Guide

The circuit is very simple as far as the basic input and output connections are concerned. (See Figure 1 for proper test and measurement set-up.) However, due to the high current nature of this design, care must be exercised or unreliable results will be obtained. The first consideration is the wire gauge for input and output power connections. The load current of 30A will require at least four strands of AWG 18 wire or equivalent for the output power and ground connections. The input power wiring size is two strands of AWG 18 or equivalent. The input and output connector terminals for DC226A are #10 brass studs. It is important that all these connections be tightly secured before applying power to the circuit.

The lab supply used for the input source of DC226A must be capable of supplying a current estimated to be ($1.1 \bullet V_O \bullet I_O/V_{IN}$). For 3.3V out and 12V in, the lab supply should provide at least 10A. To prevent interaction between the lab supply and the demo board, additional low impedance electrolytic capacitors at the output of the lab supply are recommended. This is particularly important for transient load testing if long input wires are used.

Since foldback current limiting is built into the LTC1629, some caution must be exercised when testing the DC226A. If a constant-current mode electronic load is used, the initial current must set to a lower value (2A recommend) to bring up the circuit. Otherwise, the circuit may not be able to start because the I-V characteristics of the electronic load will trigger the foldback current limit function of the LTC1629 and shortly thereafter, its shutdown mechanism. Also, pay attention to the current rating of the electronic load. Some electronic loads cannot provide the rated current at very low output voltages. For low voltage, high current applications, the resistance of the output cables of DC226A must be minimized to obtain the highest possible load current from the electronic load. Older style, Darlington-based electronic loads may not be useful for 3.3V or lower outputs.

If desired, a low current (100mA) lab supply set for a 5V output may be connected to the $EXTV_{CC}$ and SGND terminals on the demo board with a pair of twisted wires. The maximum allowable voltage applied to $EXTV_{CC}$ is 7V. In this case, turn on the main power supply before turning on the 5V supply during the start-up.

The remote sense pins of DC226, $SENSE^+$ and $SENSE^-$, may be connected to the positive and negative terminals of the load directly through a pair of twisted wires. These don't need to be heavy gauge wire as they carry only a few hundred microamps.

Attach the voltmeters to the input and output terminals directly to measure the input voltage and output voltage, respectively. Always use current shunts to measure the input and output current. Put one in each power path and do not remove either during the efficiency measurements. Use a bench fan to force some air flow over the circuit when the load current is above 15A.

Before turning on the circuit, preset the input voltage to the desired voltage and the load to 2A. After the circuit is brought up, increase the load to the desired level.

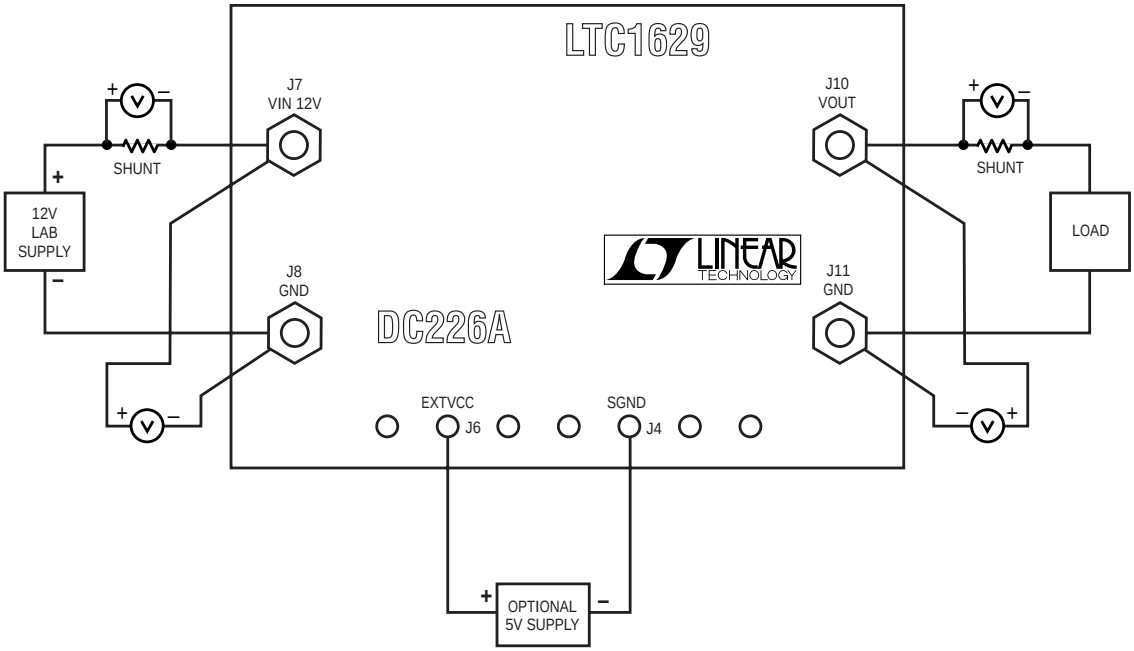


Figure 1. DC226A Test and Measurement Setup