

LTC1530 Constant-Frequency Synchronous DC/DC Converter

Description:

Demonstration Circuit DC235A is a constant-frequency, high efficiency boost converter using the LTC1530 switching regulator and the LTC1517-5 charge pump. This demo board is optimized for use with a 3.3V input and generates a constant 5V output. The LTC1530 has a 3.5V undervoltage lockout threshold; therefore the LTC1517-5 charge pump is used to generate 5V from 3.3V input, which provides power to the LTC1530 during start up. After a few cycles, the LTC1530 powers itself from its output and the LTC1517-5 is taken out of the picture by the reversed-biased diode D1. The LTC1530 uses a 300kHz switching frequency and voltage mode control to switch a pair of N-channel power MOSFETs. Operating efficiencies exceeding 90% are obtained for load currents from 0.75A to 4.25A. Gerber files for this circuit board are available. Call the LTC factory.

Performance Summary ($T_A = 25^\circ\text{C}$)

V_{IN} 3.3V

V_{OUT} 5V

I_{OUT} 5A

Typical Output Ripple ($I_O = 5A$) = 25mV

Nominal Operating Frequency = 300kHz

Quick Start Guide

Refer to Figure 2 for proper measurement equipment setup and follow the procedure outlined below:

1. Connect the 3.3V input power supply to the V_{IN} and GND terminals on the board using 14-gauge or heavier wire, soldered to the terminals.
2. Connect an ammeter in series with the input supply to measure input current.
3. Since this demo board operates with low input voltage and high output current, it is essential that the input voltage source be well regulated. If the input power supply is equipped with sense lines, connect $SENSE^+$ to V_{IN} and $SENSE^-$ to the GND terminal on the board.
4. Connect either power resistors or an electronic load to the V_{OUT} and GND terminals using 16-gauge or heavier wire, soldered to the terminals.

5. Connect an ammeter in series with output load to measure output current.
6. Connect a voltmeter across the V_{IN} and GND terminals to measure input voltage.
7. Connect a voltmeter across the V_{OUT} and GND terminal to measure output voltage.
8. After all connections are made, turn on input power and verify that the output voltage is 5V.

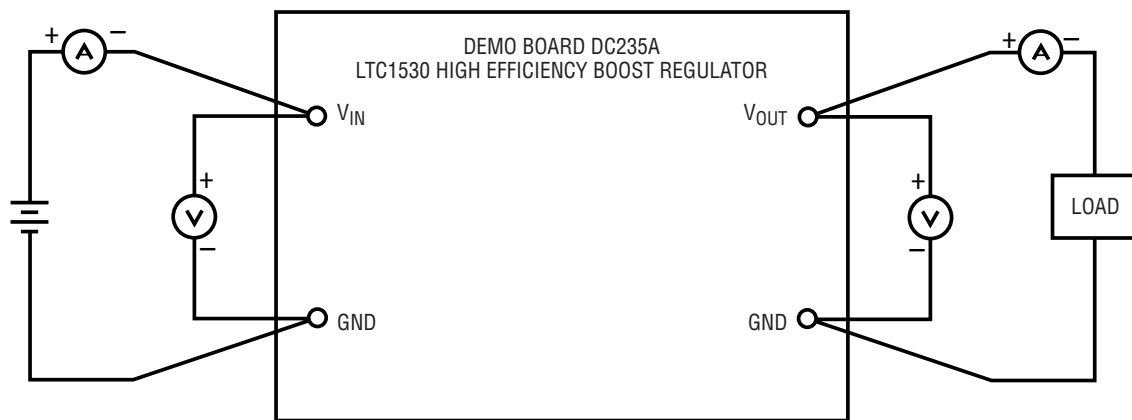


Figure 2. DC235A Proper Measurement Setup