DC413 Description

Demonstration Circuit DC413 is a step-down converter using the LTC3404 monolithic synchronous buck regulator. DC413 is a very small circuit, capable of delivering 200mA at an output voltage of 1.8V. DC413 is able to do this because the LTC3404 comes in a tiny MS8 package and operates at a very high frequency of 1.4MHz, allowing the use of tiny surface mount components (all passive components on the DC413 come in 0805 size or smaller). The miniature size, along with high efficiency (<95%) and an input voltage range from 2.65V to 6V, make the LTC3404 ideal for battery-powered applications.

LTC3404 DC413 Quick Start Guide

The DC413 demonstration board is easy to set up to evaluate the performance of the LTC3404. Please follow the procedure outlined below for proper operation.

1. Connect the input power supply to the V_{IN} and GND terminals. Refer to Figure 1 for the proper measurement equipment setup.

2. Connect the load between the V_{OUT} and GND terminals.

3. To shut down the circuit, connect the RUN pin to ground.

4. For synchronized operation, connect a clock signal between the SYNC and GND terminals.

Figure 1. DC413 Test and Measurement Setup

DC413 Test Procedure

1. Apply 3.3V at V_{IN} with 200mA of load current. Measure V_{OUT}; it should be 1.8V ±2.5% (1.755V to 1.845V).

2. While sustaining the 200mA load current, observe the voltage waveform at the switch node (pin). Verify that the switching frequency is between 1.25MHz and 1.65MHz (t = 0.8µs to 0.6µs).

3. Vary the input voltage from 2.7V to 6V. The output voltage should be within ±3% tolerance (between 1.746V and 1.854V). When finished, set the input voltage back to 3.3V.

4. Decrease the load current to 20mA. The output voltage should be within a tolerance of ±4% (from 1.728V to 1.872V). Leave the load current at 20mA when the test is completed.

5. Force the voltage at pin 1 (RUN) to below 0.3V and measure the output. The IC should shut down, so the output should be at 0V.