



**Leupold**  
**-150V Buck-Boost Design**  
**12/7/07**

The following test report is for the Leupold -150V Buck-Boost power supply project that includes measurements for the following output voltage: -150V@5mA

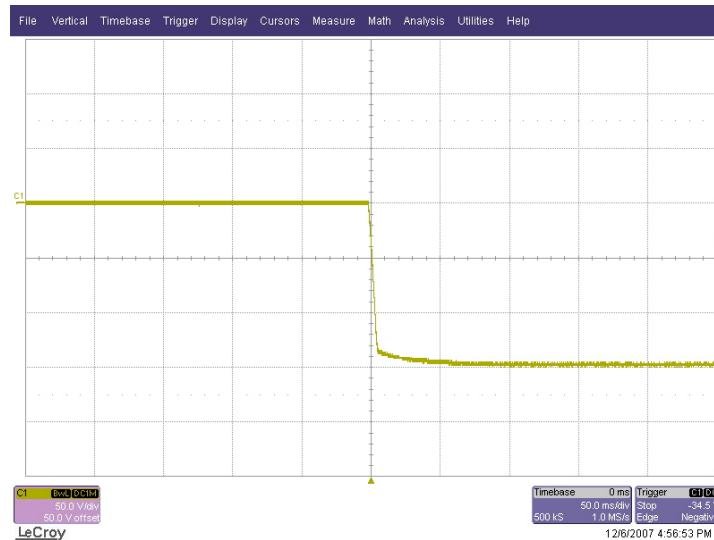
The tests performed on the -150V output were as follows:

- A. Turn-On (No Load)
- B. Turn-Off (5mA Load)
- C. Output Voltage Ripple (Measured with Full Load)
- D. Transient Response (1mA to 5mA; 5mA to 1mA)
- E. Switch Node (20MHz Bandwidth Limited)
- F. Loop Response

## 1 Startup - (TPS40200 : -150V)

The photo below shows the startup waveform. The input voltage is 12V, the output is not loaded.

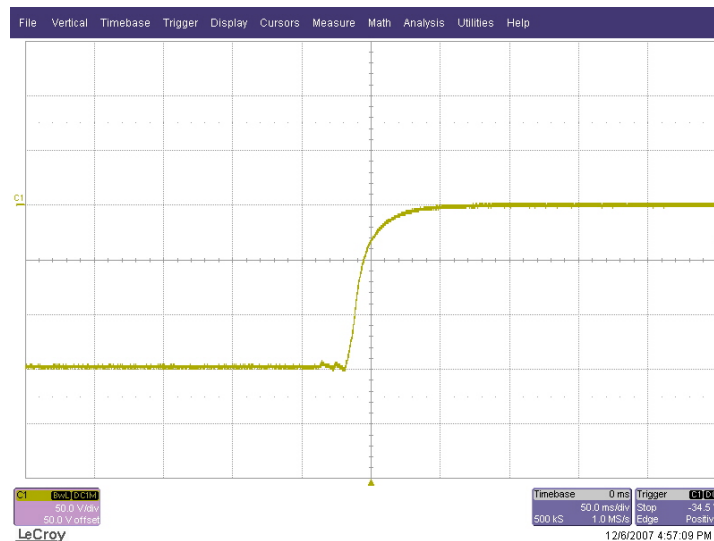
Channel 1 : -150V Output – Yellow (50V/Division)



## 2 Shutdown - (TPS40200 : -150V)

The photo below shows the shutdown waveform. The input voltage is 12V, the output is loaded with 5mA.

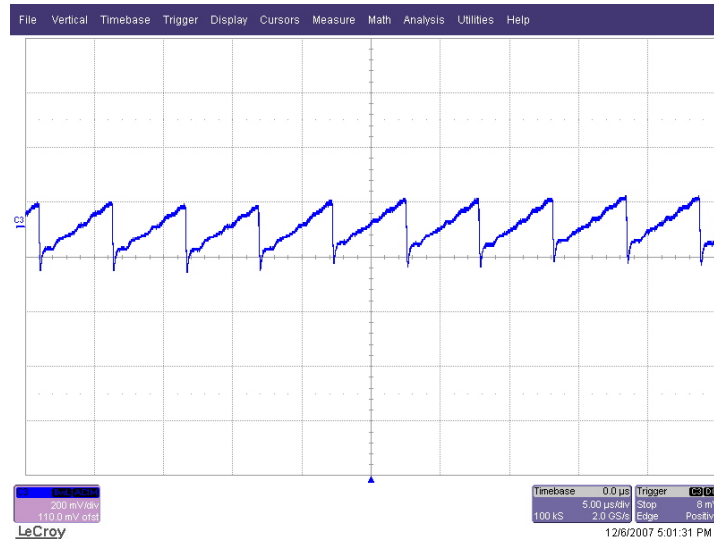
Channel 1 : -150V Output – Yellow (50V/Division)



### 3 Output Ripple Voltage - (TPS40200 : -150V)

The output voltage ripple is shown in the figure below. The input is 12V. The output is fully loaded. The timebase is 5 $\mu$ s/Division.

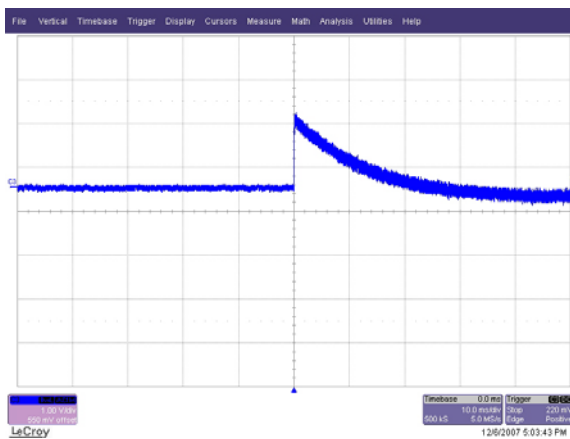
Channel 3 : Output Voltage – Blue (200mV/Division; AC Coupled)



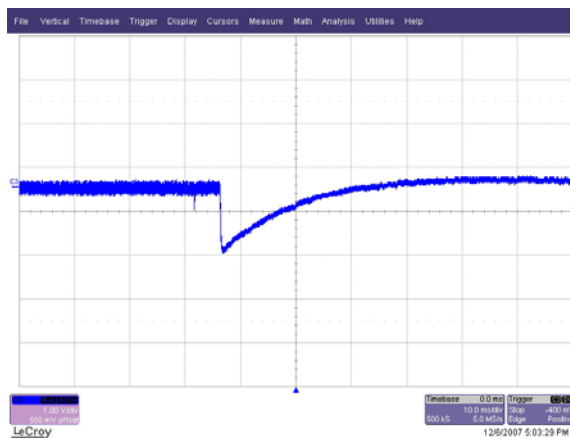
### 4 Transient Response – (TPS40200 : -150V)

The transient response of the converter is shown in the figures below. The input voltage is 12V. The output is pulse from 3A to 30A.

Channel 3 : Output Voltage – Blue (1V/Division)



1mA to 5mA Transition

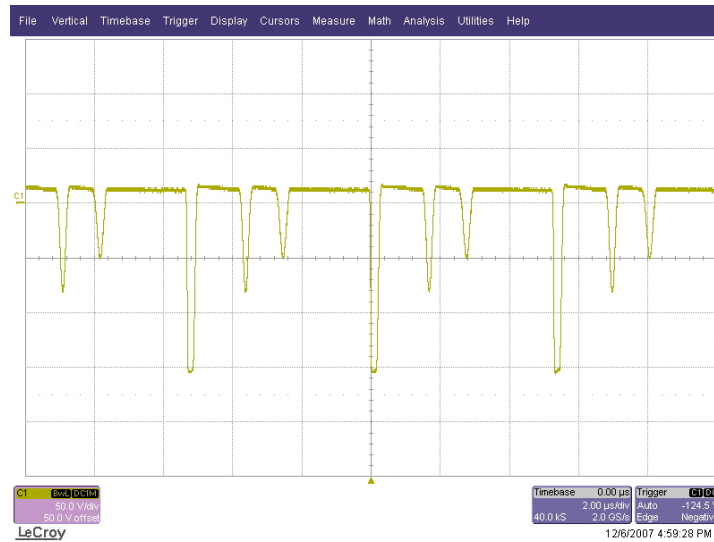


5mA to 1mA Transition

## 5 Switching Waveforms - (TPS40200 : -150V)

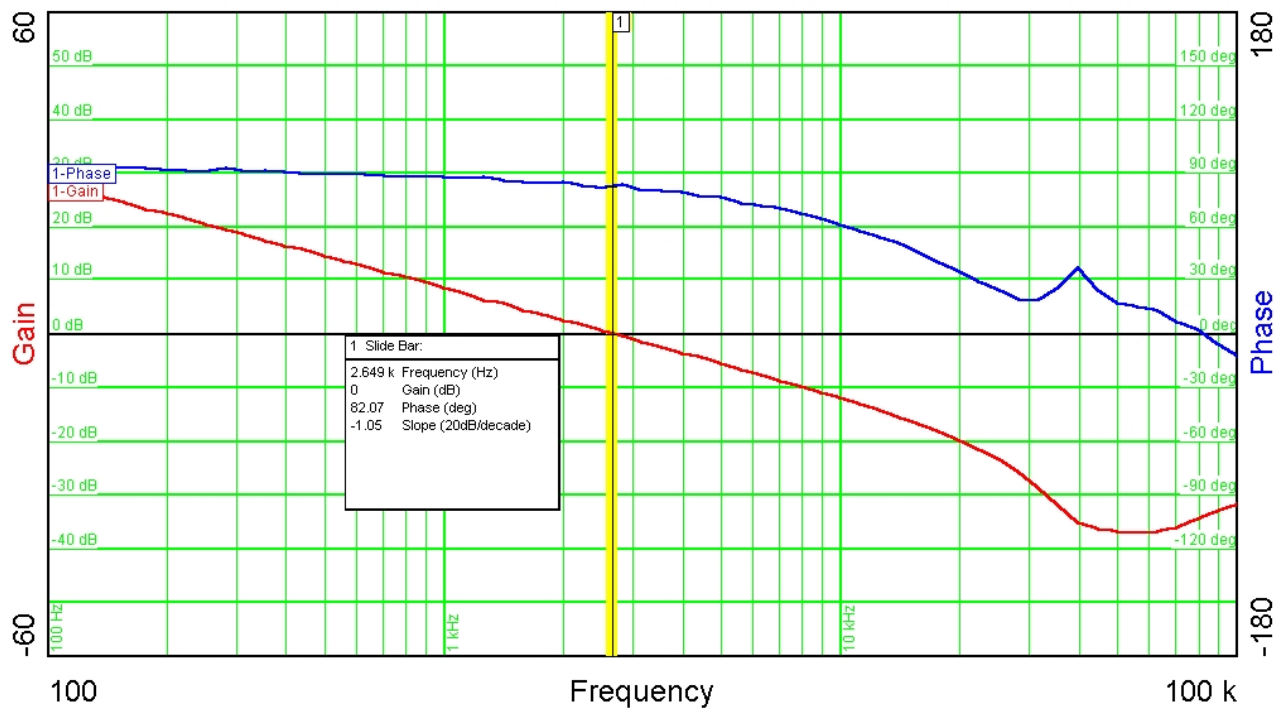
The figure below shows the switching waveform of the master. The input is 12V.

Channel 1 : Switch Node – Yellow (50V/Division)



## 6 Loop Response

The loop response for the converter is shown in the figure below. The input voltage is 12V, the output is fully loaded.



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