TPS5124 Dual Synchronous Buck Project
3/18/08

The following test report is for the TPS5124 Dual Synchronous Buck.

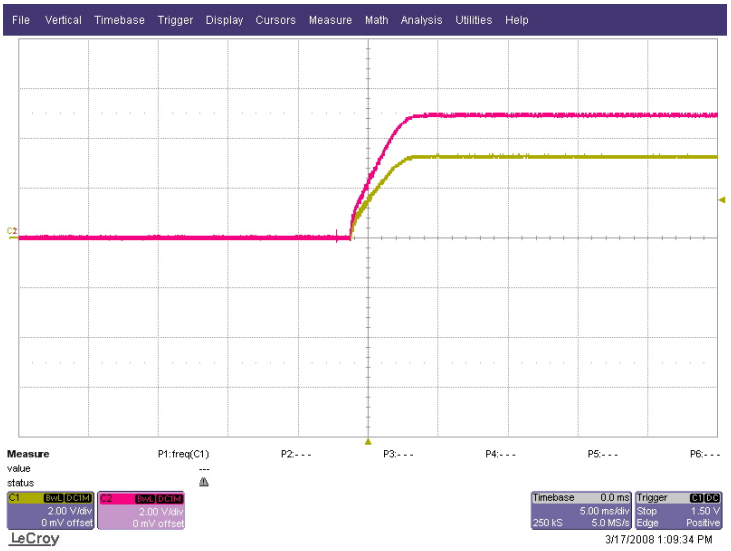
The tests performed were as follows:

A. TPS5124 – 3.3V@25A; 5V@20A
   1. Turn-On (No load)
   2. Turn-Off (1A load)
   3. Output Voltage Ripple (full load)
   4. Transient Response (5A to 20A)
   5. Load Regulation (No load to full load)
   6. Efficiency
   7. Switch Node (20MHz Bandwidth Limited with full load)
   8. Bode Plot (Full Load)

1 Startup – (TPS5124 : 3.3V@25A; 5V@20A)

The photo below shows the startup waveform. The input voltage is 12V, the outputs are not loaded. The time-base is set to 5ms/Division.

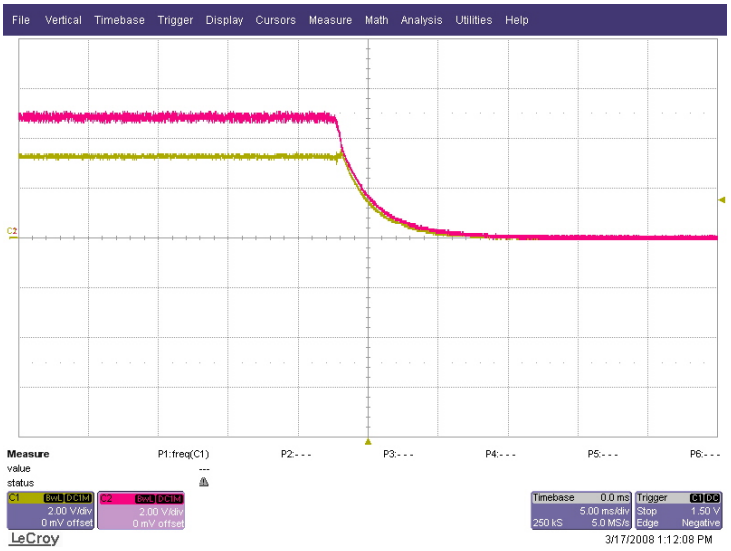
Channel 1 – Yellow : 3.3V Output – (2V/Division)
Channel 2 – Pink : 5.0V Output – (2V/Division)



2 Shutdown – (TPS5124 : 3.3V@25A; 5V@20A)

The photo below shows the shutdown waveforms. The input voltage is 12V. The outputs are loaded with 1A.

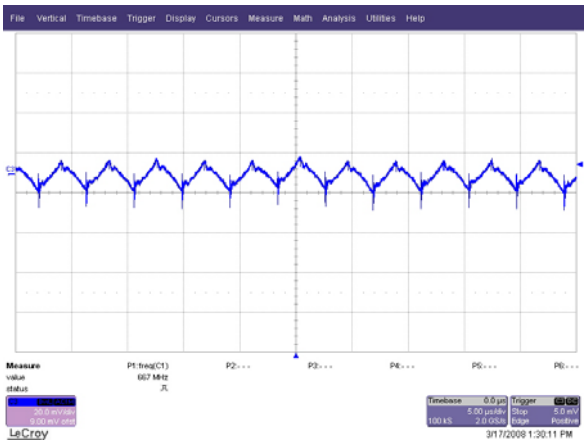
Channel 1 – Yellow : 3.3V Output – (2V/Division)
Channel 2 – Pink : 5.0V Output – (2V/Division)



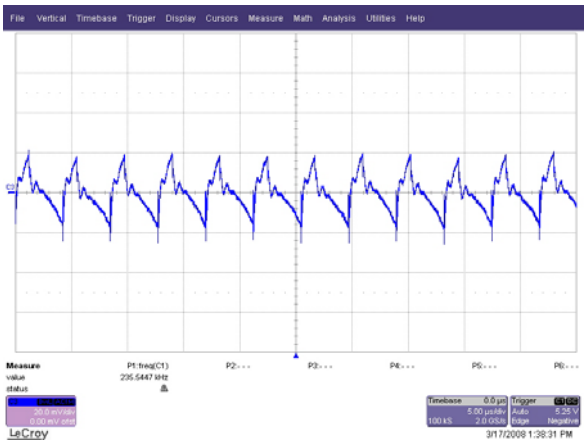
3 Output Ripple Voltage – (TPS5124 : 3.3V@25A; 5V@20A)

The output voltage ripple is shown in the figure below. The input is 12V. The outputs are fully loaded.

Channel 3: Output Voltage – (20mV/Division; AC Coupled)



3.3V@25A

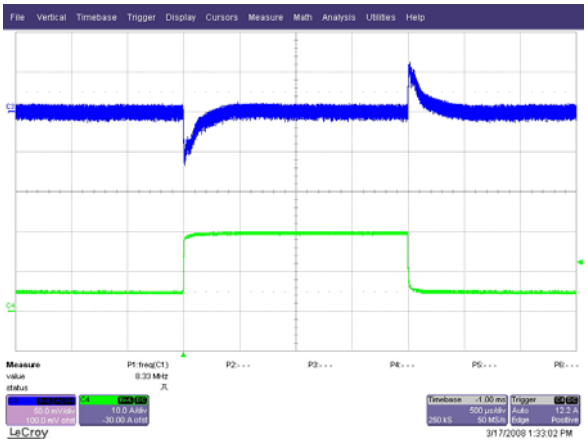


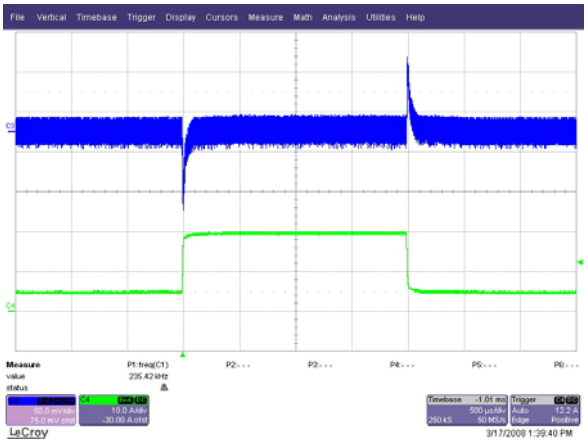
5.0V@20A

4 Transient Response – (TPS5124 : 3.3V@25A; 5V@20A)

The transient response of the converter is shown in the figure below. The input voltage is 12V. The current is pulsed from 1A to 3A.

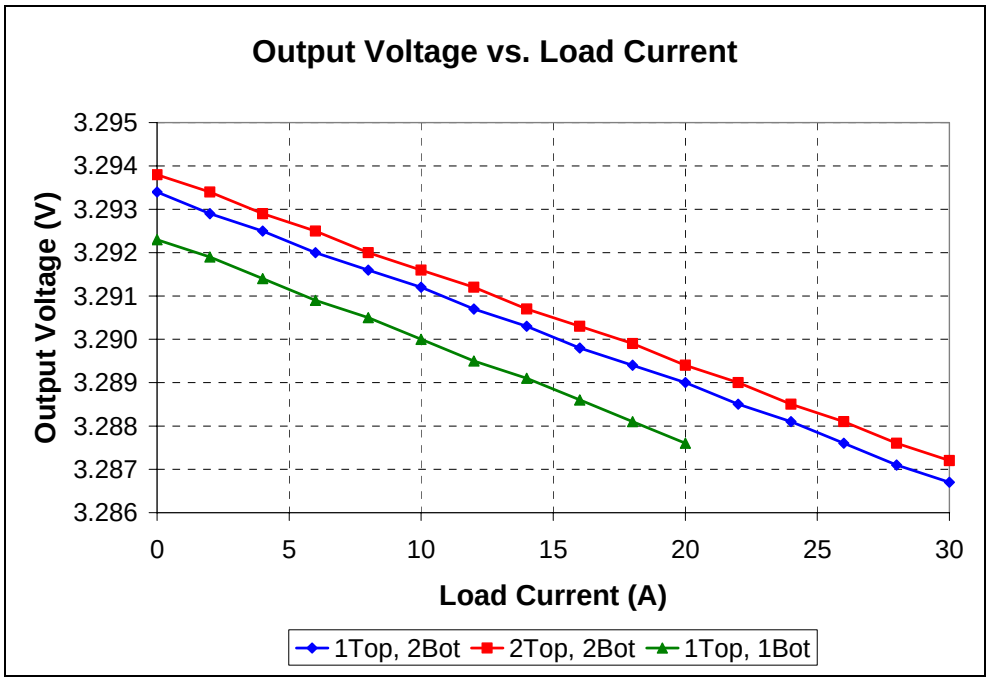
Channel 3:Output Votlage – (50mV/Division; AC Coupled)
Channel 4: Output Current – (10A/Division)

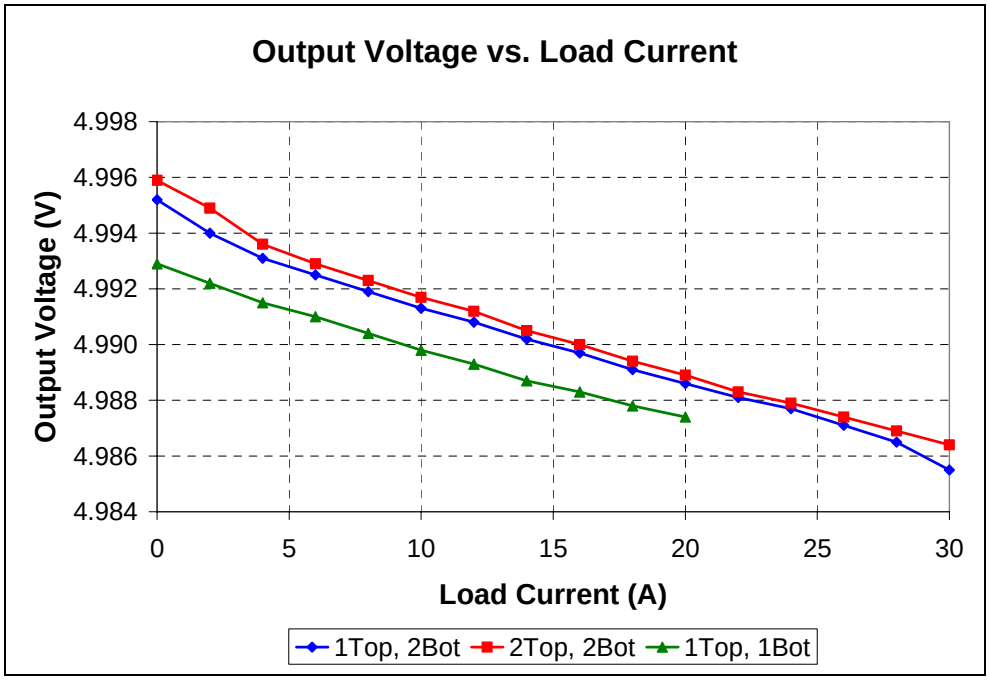




5 Load Regulation – (TPS5124 : 3.3V@25A; 5V@20A)

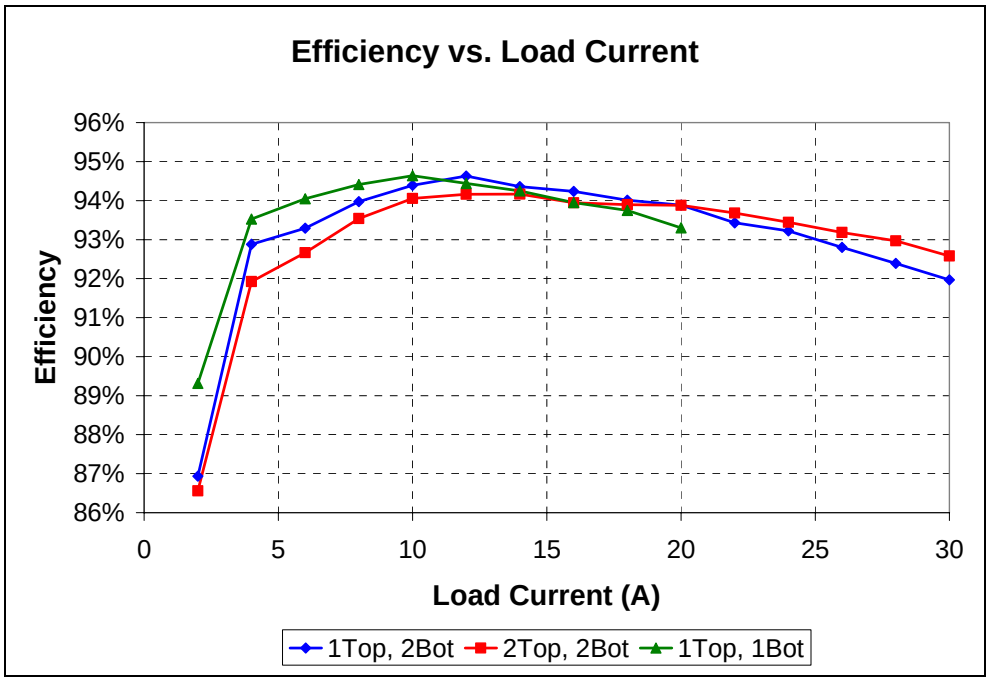
The load regulation is shown in the figures below.



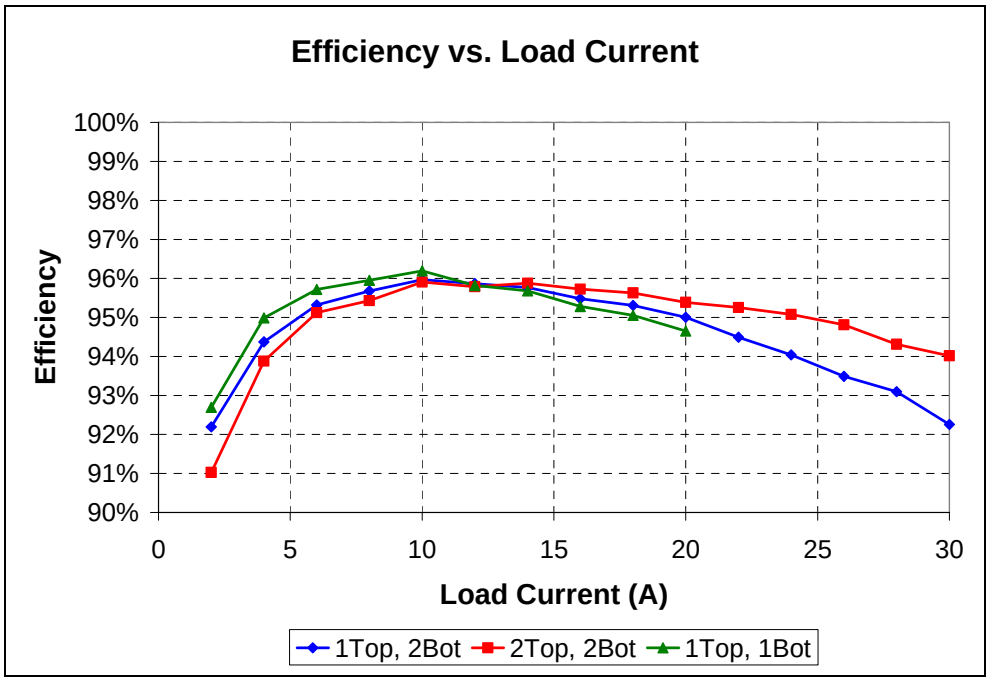


6 Efficiency – (TPS5124 : 3.3V@25A; 5V@20A)

The efficiency of the converter is shown in the picture below.



3.3V Output



5.0V Output

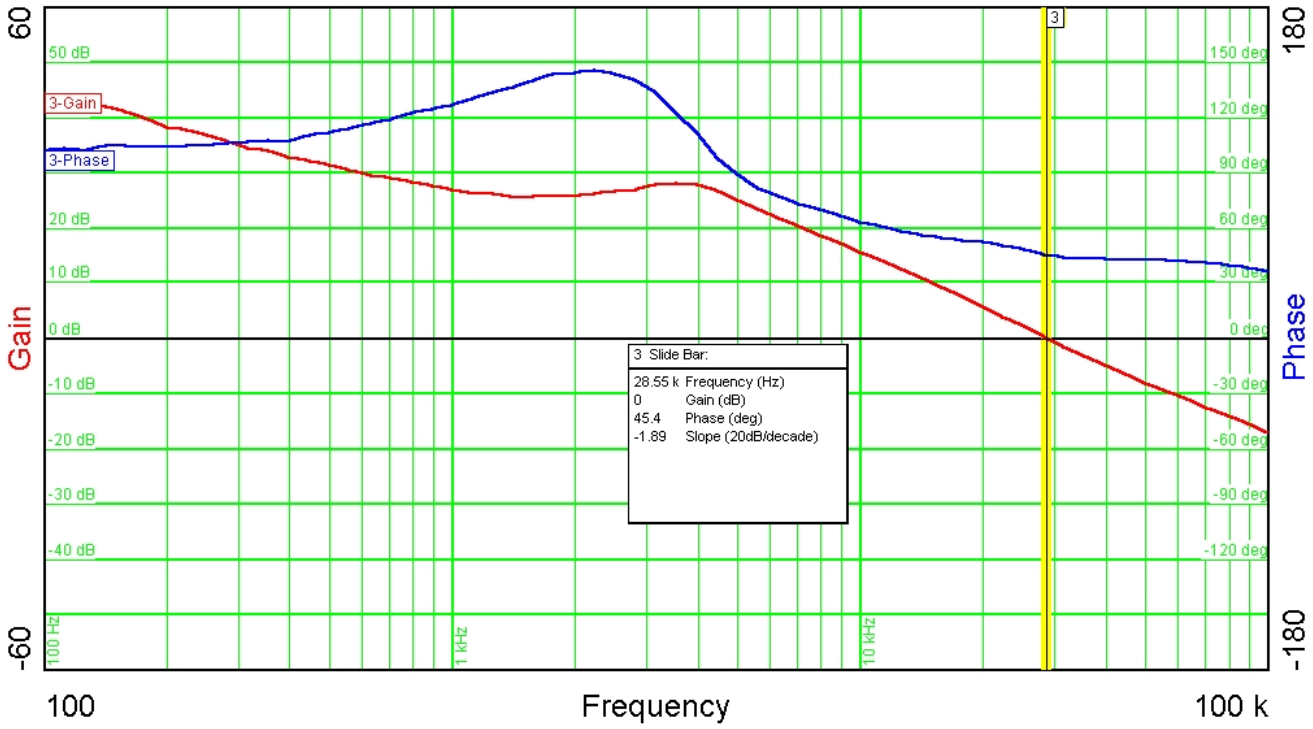
7 Switching Waveforms – (TPS5124 : 3.3V@25A; 5V@20A)

The waveform below shows the switch node for each output. The input is 12V. The outputs are fully loaded.

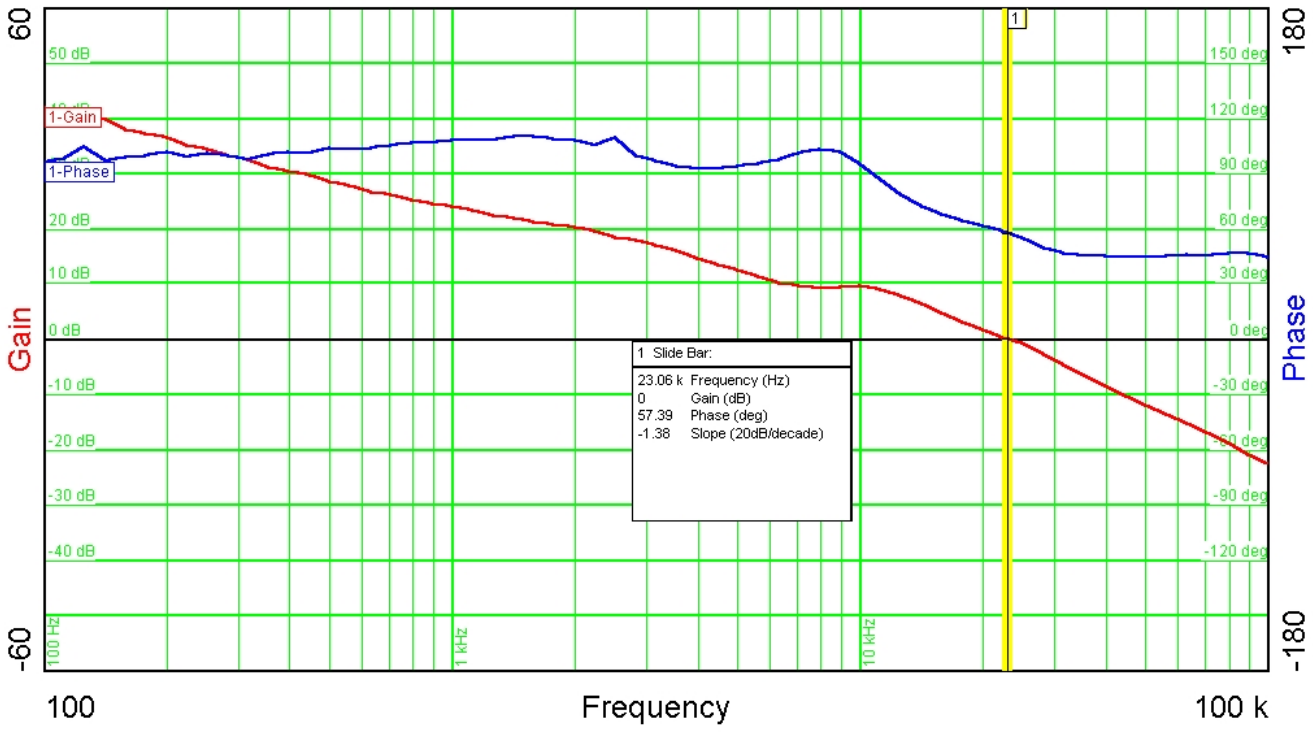
Channel 1: Switch Node 5.0V Output – (5V/Division)
Channel 2: Switch Node 3.3V Output – (5V/Division)

8 Bode Plot – (TPS5124 : 3.3V@25A; 5V@20A)

The figures below show the frequency response of the converters. The input voltage is 12V, the outputs are fully loaded.



3.3V Output


60
50 dB
1-Gain
1-Phase
20 dB
10 dB
0 dB
-10 dB
-20 dB
-30 dB
-40 dB
-60
Gain
100 Hz
1 kHz
10 kHz
1
180
150 deg
120 deg
90 deg
60 deg
30 deg
0 deg
-30 deg
-90 deg
-120 deg
-180
Phase
1 Slide Bar:
23.06 k Frequency (Hz)
0 Gain (dB)
57.39 Phase (deg)
-1.38 Slope (20dB/decade)
100
Frequency
100 k

5.0V Output

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