PMP3991 Rev B Test Results

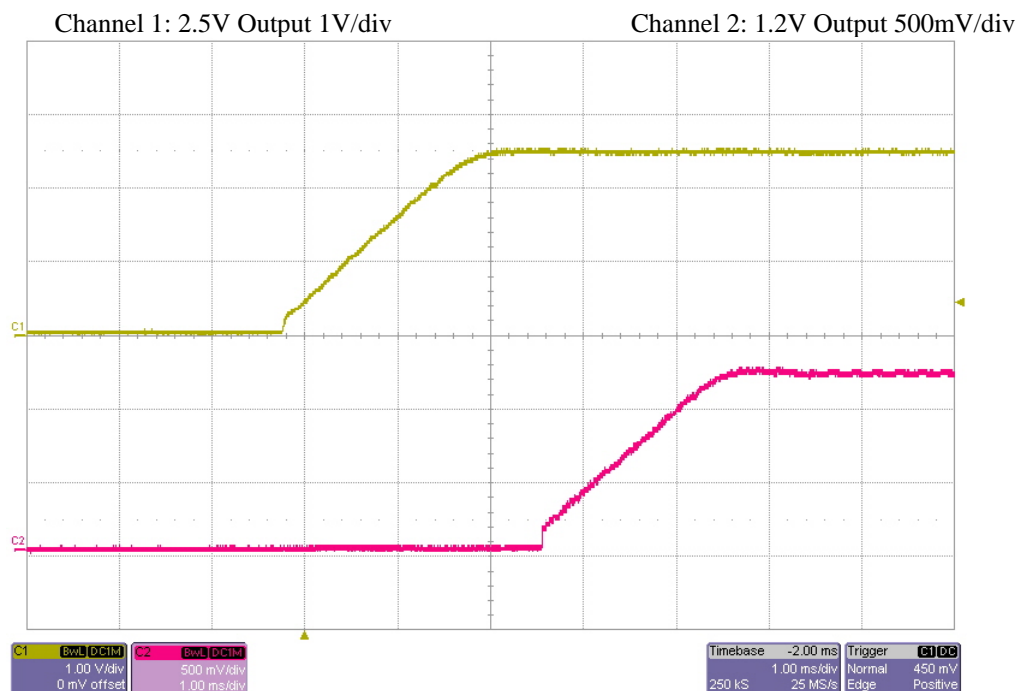**TEXAS INSTRUMENTS**

1 Photo

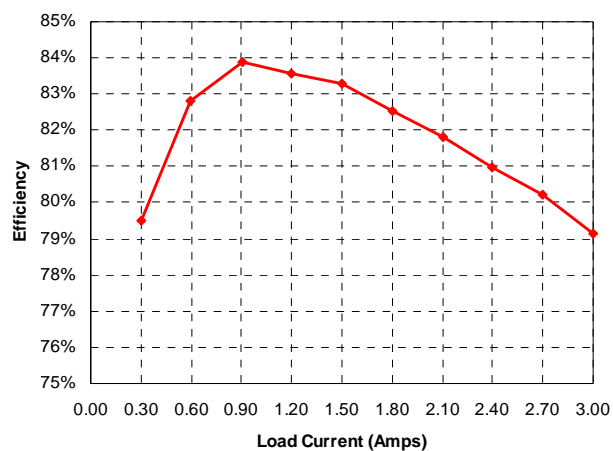The photograph below shows the PMP3991 Rev B demo board. The circuit is built on a PMP3137 Rev A PWB.

2 Startup

The output voltages at startup are shown in the image below. The input voltage was 12V, and both outputs were unloaded.

Channel 1: 2.5V Output 1V/div   Channel 2: 1.2V Output 500mV/div

Power Management Solutions

3   Efficiency: 2.5V output

The efficiency data is shown in the table and graph below.

Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.000	2.521	12.0	0.004	0.00	0.048	0.0%
0.299	2.521	12.0	0.079	0.75	0.194	79.5%
0.599	2.521	12.0	0.152	1.51	0.314	82.8%
0.902	2.522	12.0	0.226	2.27	0.437	83.9%
1.201	2.522	12.0	0.302	3.03	0.595	83.6%
1.502	2.522	12.0	0.379	3.79	0.760	83.3%
1.806	2.522	12.0	0.460	4.55	0.965	82.5%
2.101	2.523	12.0	0.540	5.30	1.179	81.8%
2.399	2.523	12.0	0.623	6.05	1.423	81.0%
2.701	2.523	12.0	0.708	6.81	1.681	80.2%
3.000	2.523	12.0	0.797	7.57	1.995	79.1%

4   Efficiency: 1.2V Output

The efficiency data is shown in the table and graph below.
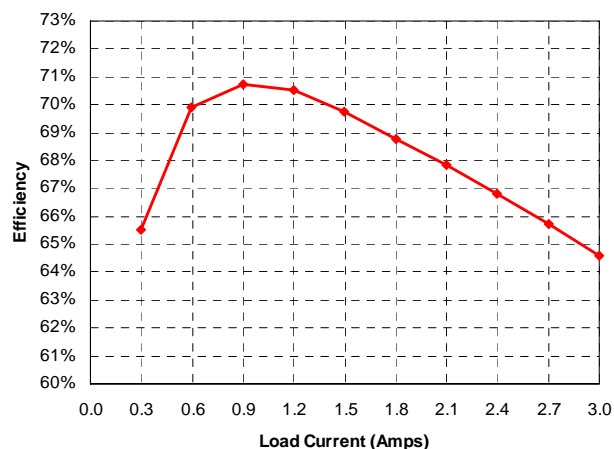
| Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.000	1.208	12.0	0.004	0.00	0.048	0.0%
0.300	1.206	12.0	0.046	0.36	0.190	65.5%
0.598	1.206	12.0	0.086	0.72	0.311	69.9%
0.901	1.206	12.0	0.128	1.09	0.449	70.7%
1.200	1.206	12.0	0.171	1.45	0.605	70.5%
1.499	1.206	12.0	0.216	1.81	0.784	69.7%
1.800	1.206	12.0	0.263	2.17	0.985	68.8%
2.100	1.206	12.0	0.311	2.53	1.199	67.9%
2.400	1.206	12.0	0.361	2.89	1.438	66.8%
2.701	1.206	12.0	0.413	3.26	1.699	65.7%
3.002	1.206	12.0	0.467	3.62	1.984	64.6%

PMP3991 Rev B Test Results

5   Thermal Image

A thermal image of the top side of the board is shown with a 3A load on both outputs. The ambient temperature was 27ºC, with no forced air flow. The top 1.2V diode (D2) was the hottest component on the board and measured 85.8ºC.
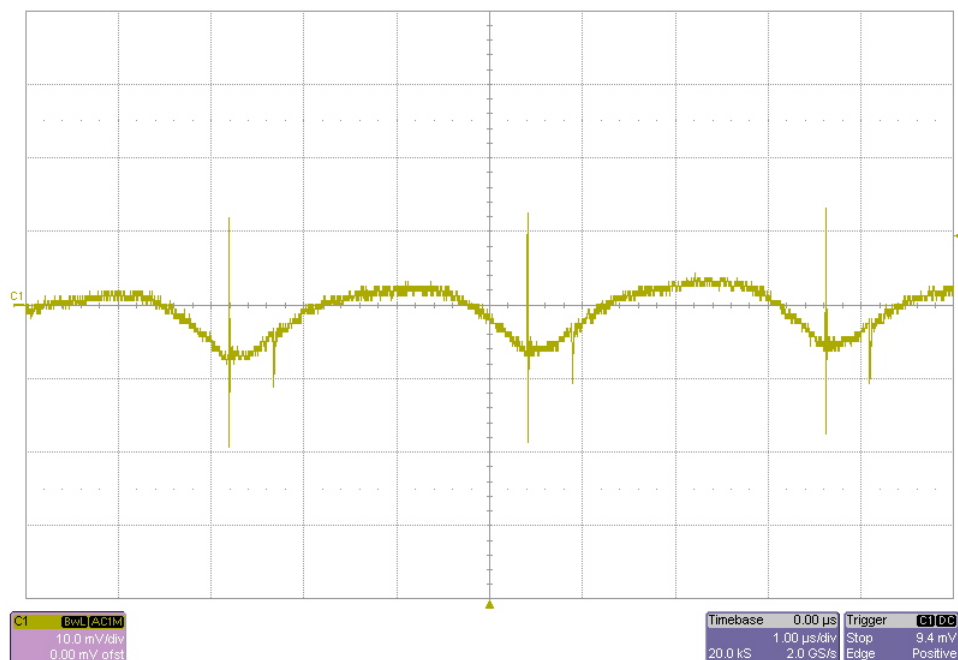

6   Output Ripple Voltage: 2.5V Output

The output ripple voltage of the 2.5V output is shown in the plot below. The input was set to 12V. The load was set to 3A.

Power Management Solutions
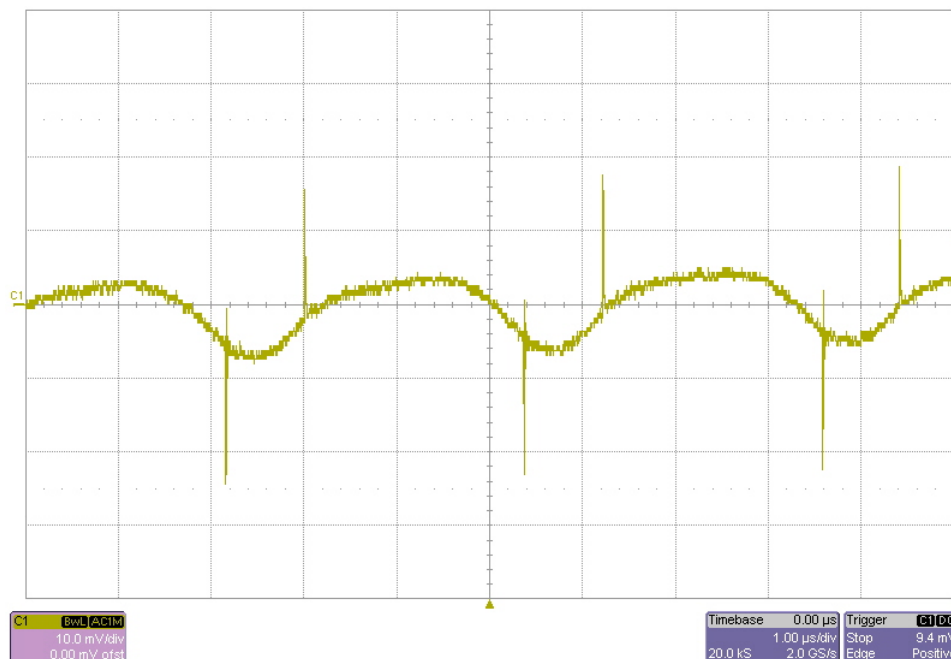
7   Output Ripple Voltage: 1.2V Output

The output ripple voltage of the 1.2V output is shown in the plot below. The input was set to 12V. The load was set to 3A.

8   Frequency Response: 2.5V Output

The frequency response of the 2.5V converter feedback loop is shown in the image below. The input was set to 12V, and the output was loaded with 3A.

PMP3991 Rev B Test Results
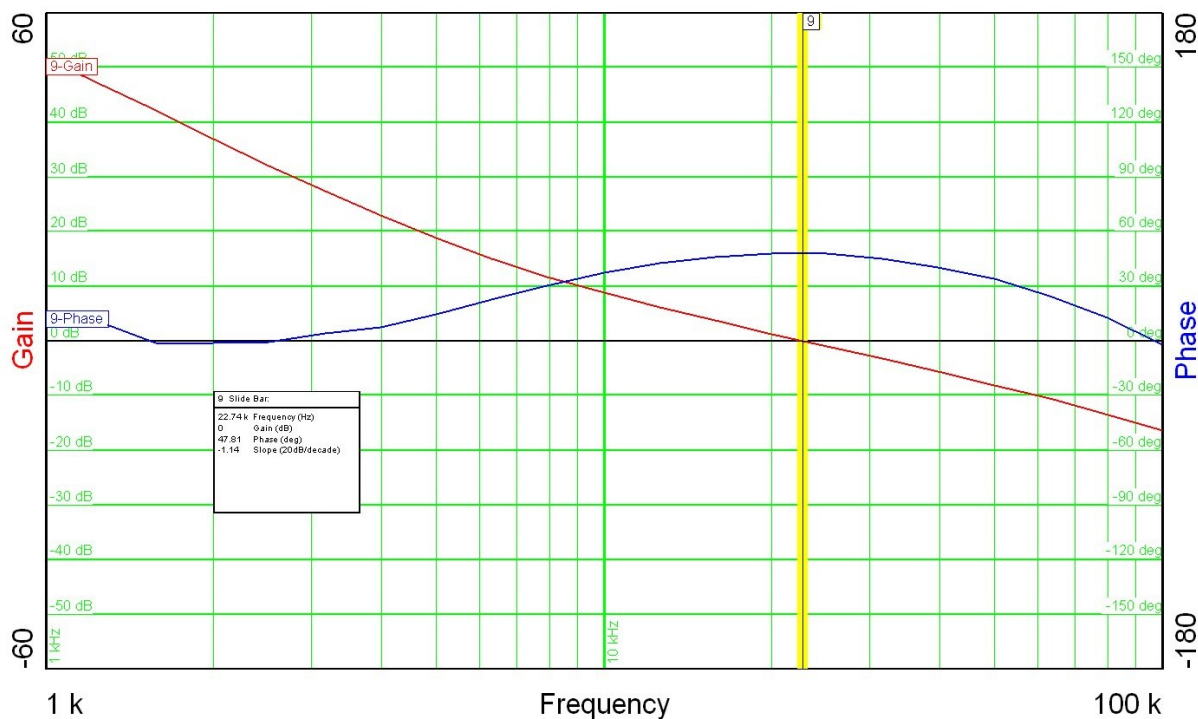
9 Frequency Response: 1.2V Output

The frequency response of the 1.2V converter feedback loop is shown in the image below. The input was set to 12V, and the output was loaded with 3A.
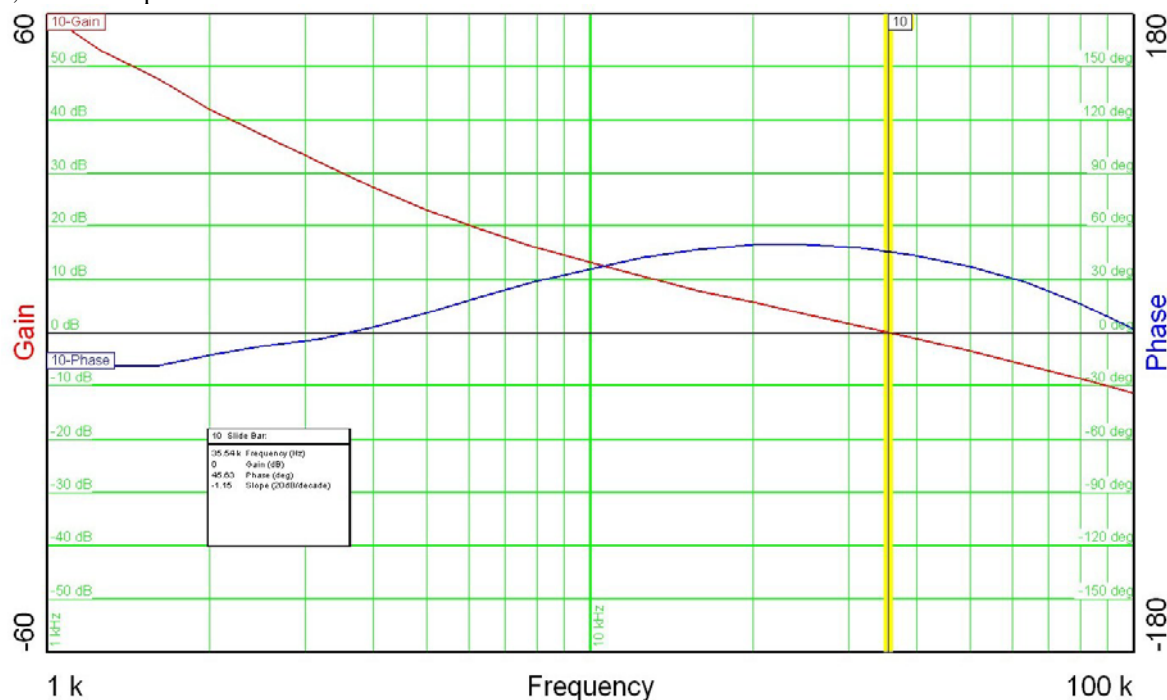
10 Load Transients: 2.5V Output

The image below shows the response of the 2.5V converter to a 1A to 2A load transient. The input voltage was set to 12V.

Channel 2: 2.5V Output Voltage (ac coupled) 50mV/div   Channel 4: 2.5V Output Current 1A/div

PMP3991 Rev B Test Results

TEXAS
INSTRUMENTS
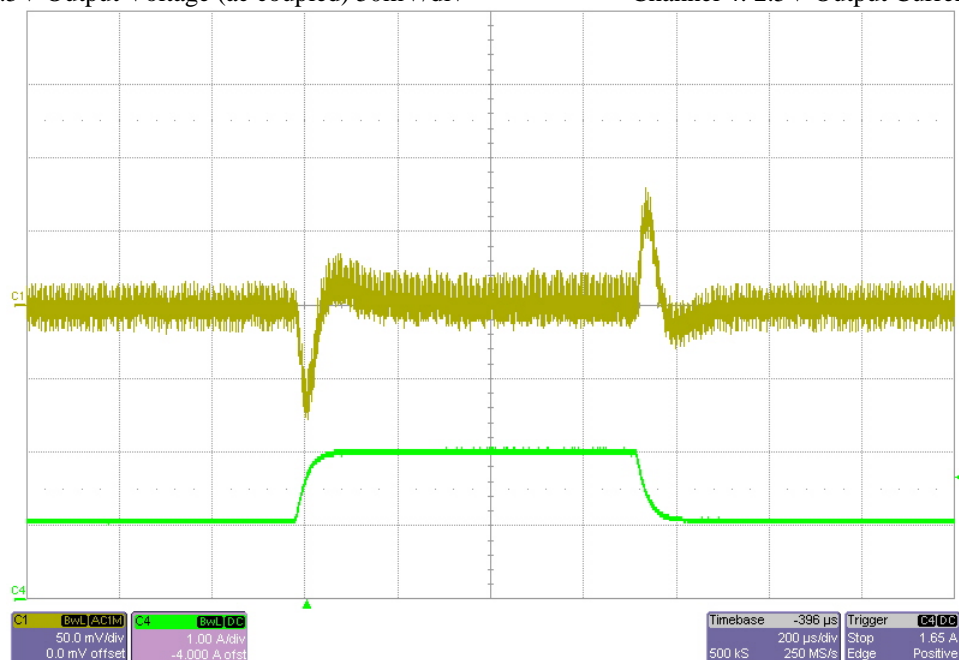
11 Load Transients: 1.2V Output

The image below shows the response of the 1.2V converter to a 1A to 2A load transient. The input voltage was set to 12V.

Channel 2: 1.2V Output Voltage (ac coupled) 50mV/div   Channel 4: 1.2V Output Current 1A/div
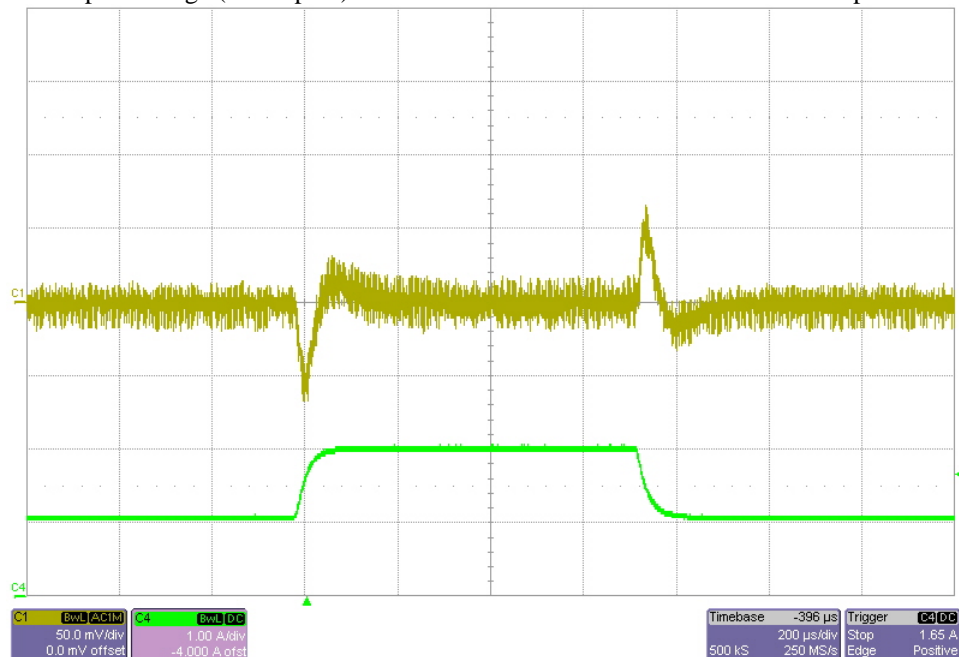
12 Switching Waveforms

The image below shows the voltage on the SW pins of the two converters. The 2.5V switching waveform is shown on Channel 1, and the 1.2V waveform is on Channel 2.

Power Management Solutions

IMPORTANT NOTICE

Products		Applications	
Audio	www.ti.com/audio	Automotive and Transportation	www.ti.com/automotive
Amplifiers	amplifier.ti.com	Communications and Telecom	www.ti.com/communications
Data Converters	dataconverter.ti.com	Computers and Peripherals	www.ti.com/computers
DLP® Products	www.dlp.com	Consumer Electronics	www.ti.com/consumer-apps
DSP	dsp.ti.com	Energy and Lighting	www.ti.com/energy
Clocks and Timers	www.ti.com/clocks	Industrial	www.ti.com/industrial
Interface	interface.ti.com	Medical	www.ti.com/medical
Logic	logic.ti.com	Security	www.ti.com/security
Power Mgmt	power.ti.com	Space, Avionics and Defense	www.ti.com/space-avionics-defense
Microcontrollers	microcontroller.ti.com	Video and Imaging	www.ti.com/video
RFID	www.ti-rfid.com		
OMAP Applications Processors	www.ti.com/omap	**TI E2E Community**	e2e.ti.com
Wireless Connectivity	www.ti.com/wirelessconnectivity		