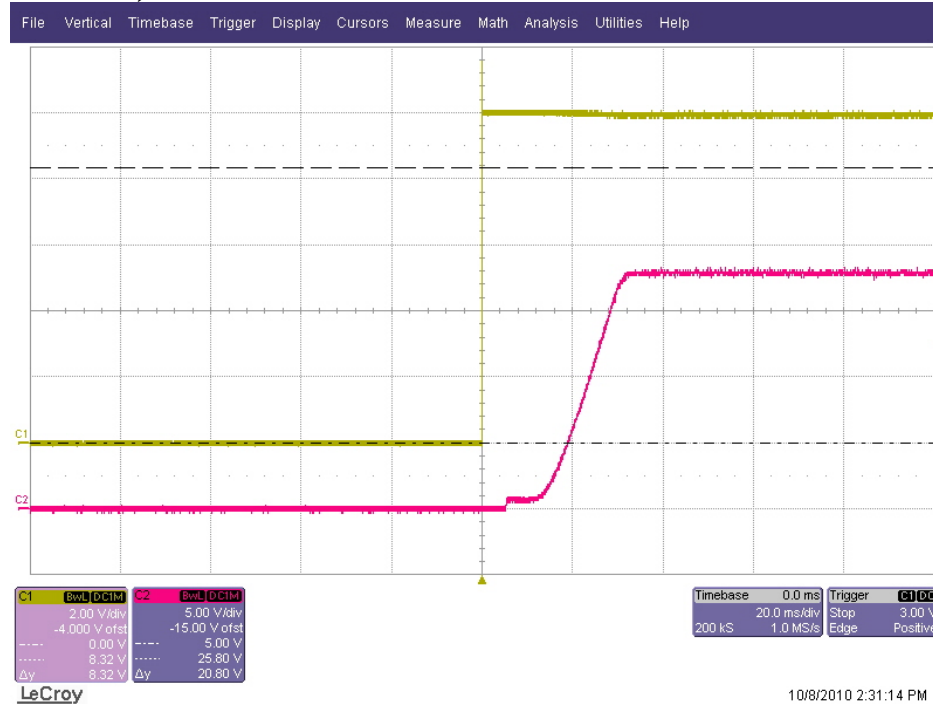


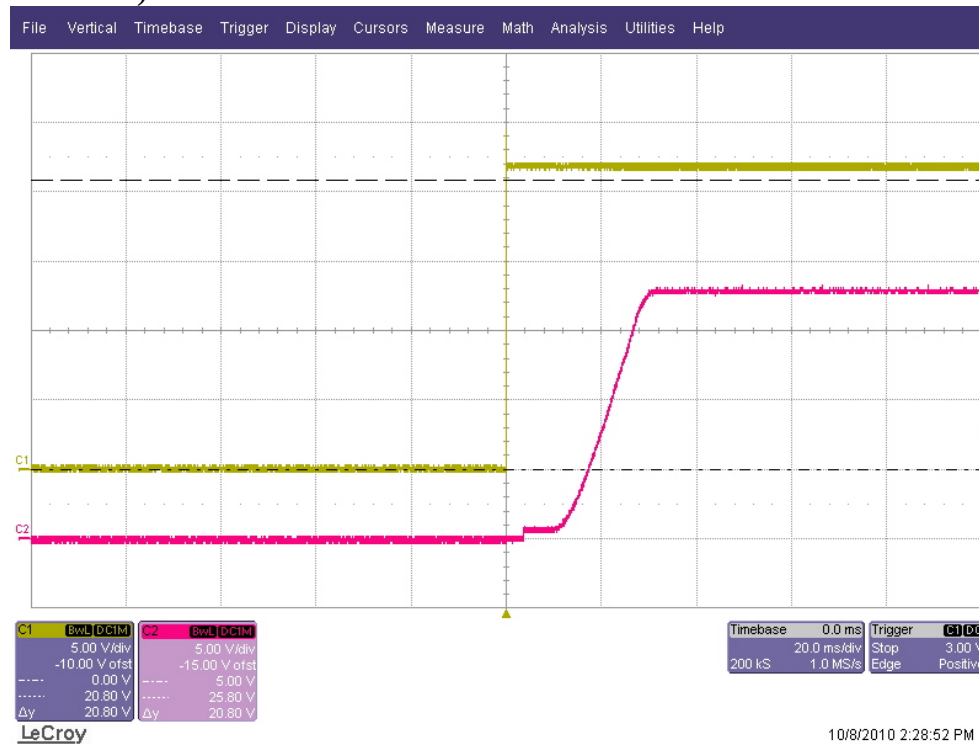
The plot below shows the output voltage startup waveform of the 18 Vout configuration (with the jumper added) after the application of 10Vin. The output was

PMP5908 Test Report

loaded at 0.4A. (Vin is Green 2V/div while Vout is Pink 5V/div. Timescale is 20ms/div.)



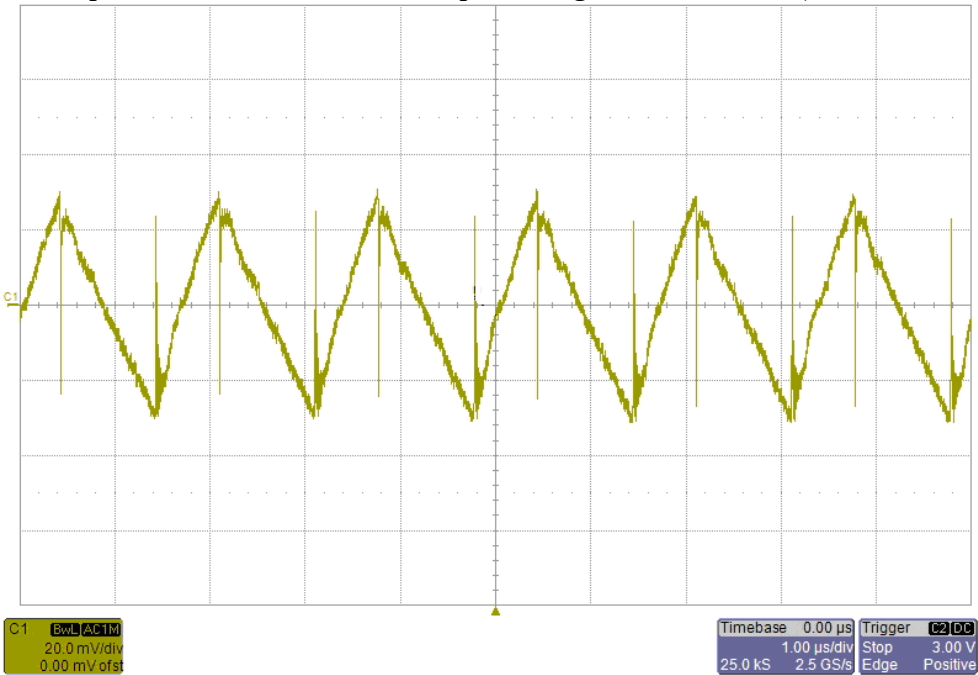
The plot below shows the output voltage startup waveform of the 18 Vout configuration (with the jumper added) after the application of 22Vin. The output was loaded at 0.4A. (Vin is Green 5V/div while Vout is Pink 5V/div. Timescale is 20ms/div.)



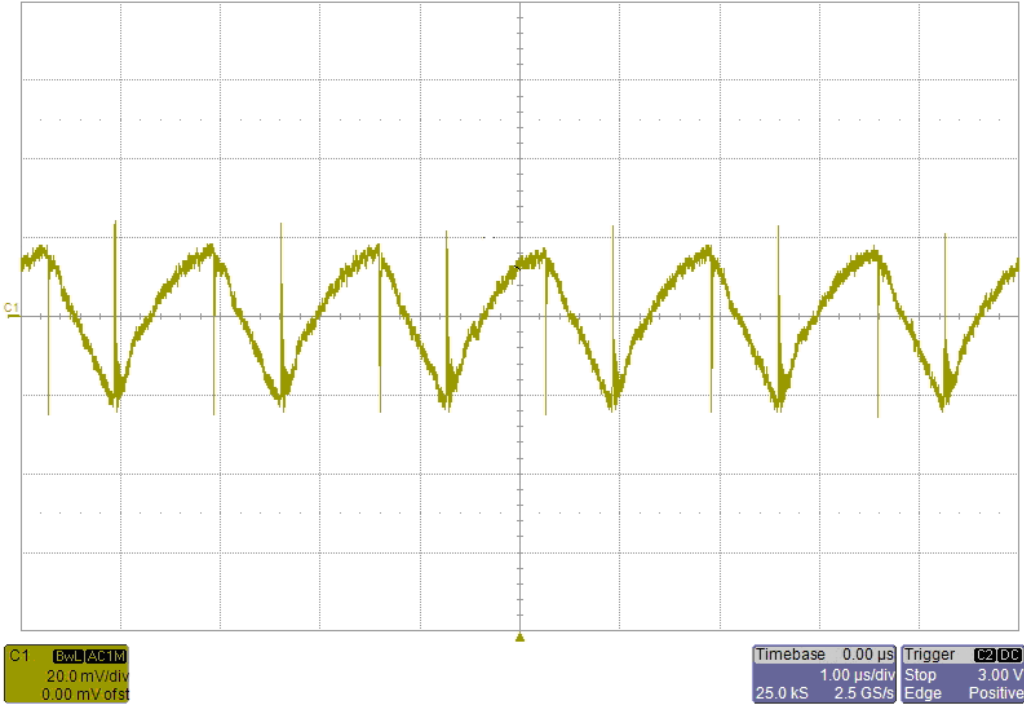
PMP5908 Test Report

2) Output Voltage Ripple

The 13.5V output ripple voltage is shown in the figure below. The image was taken with the output loaded at 0.4A and the input voltage set to 10Vdc. (20mV/DIV, 1uS/DIV)

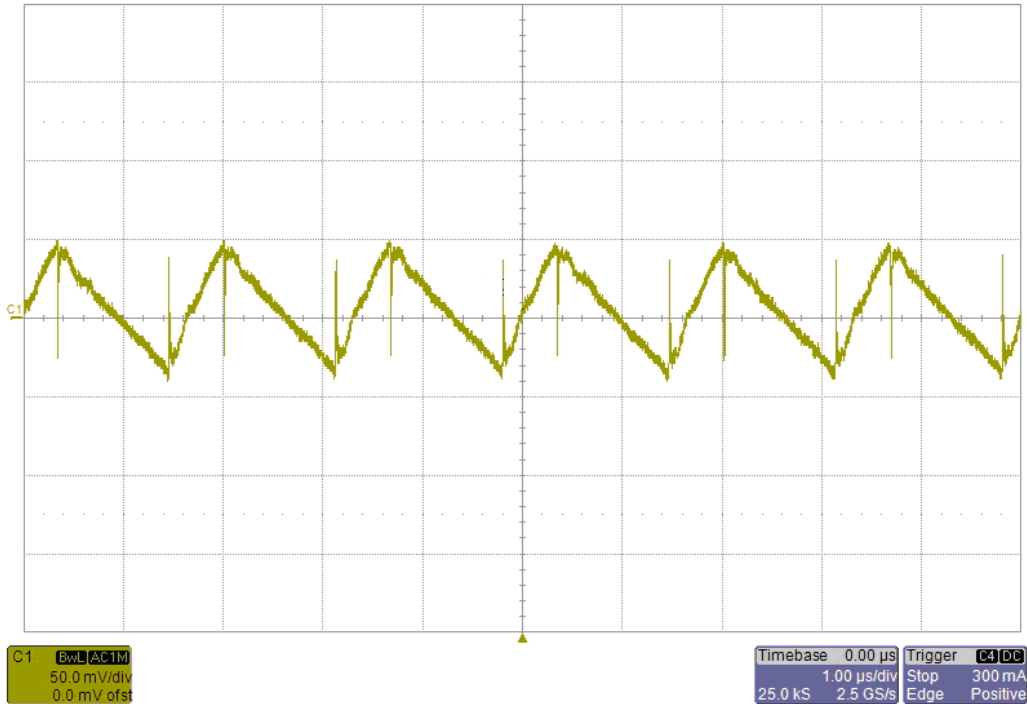


The 13.5V output ripple voltage is shown in the figure below. The image was taken with the output loaded at 0.4A and the input voltage set to 22Vdc. (20mV/DIV, 1uS/DIV)

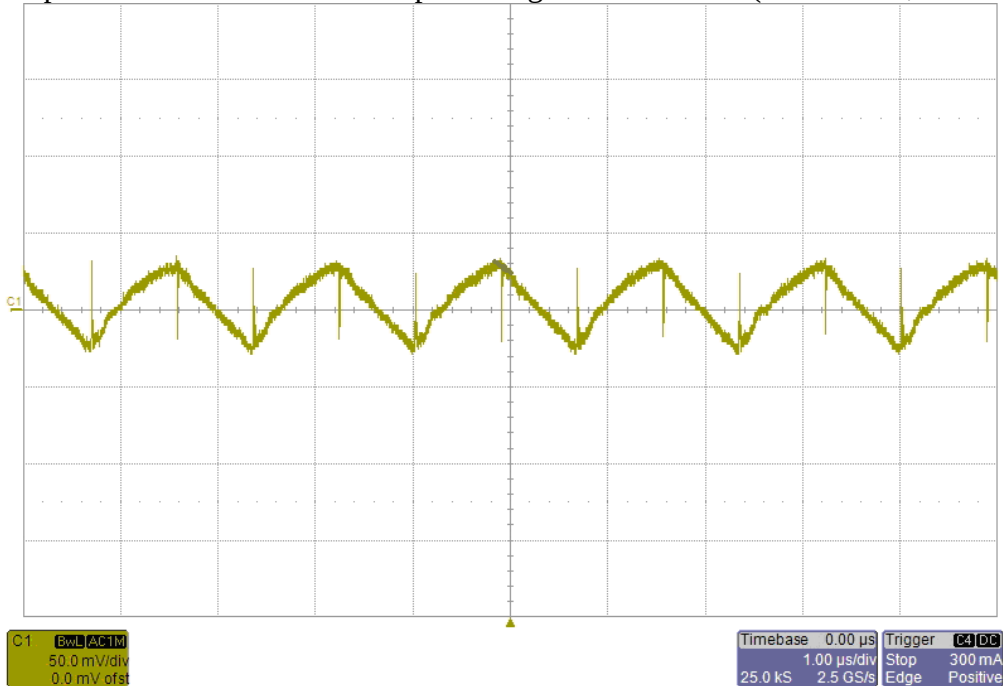


PMP5908 Test Report

18V output ripple voltage is shown in the figure below. The image was taken with the output loaded at 0.4A and the input voltage set to 10Vdc. (50mV/DIV, 1uS/DIV)



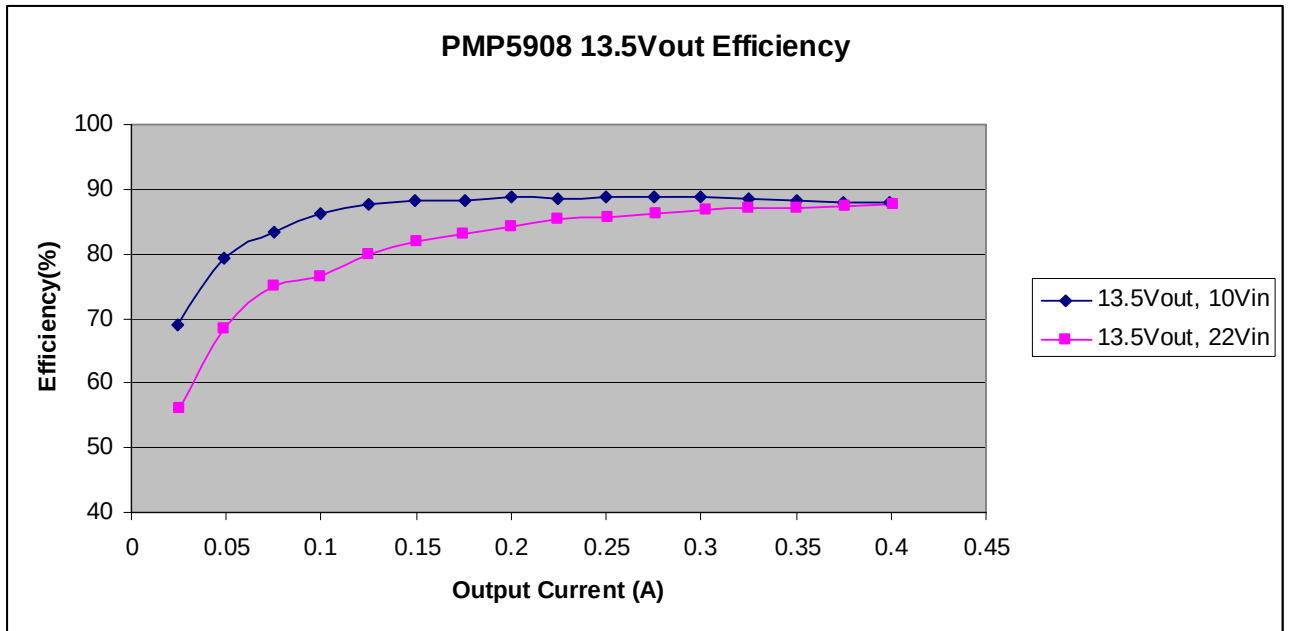
18V output ripple voltage is shown in the figure below. The image was taken with the output loaded at 0.4A and the input voltage set to 22Vdc. (50mV/DIV, 1uS/DIV)



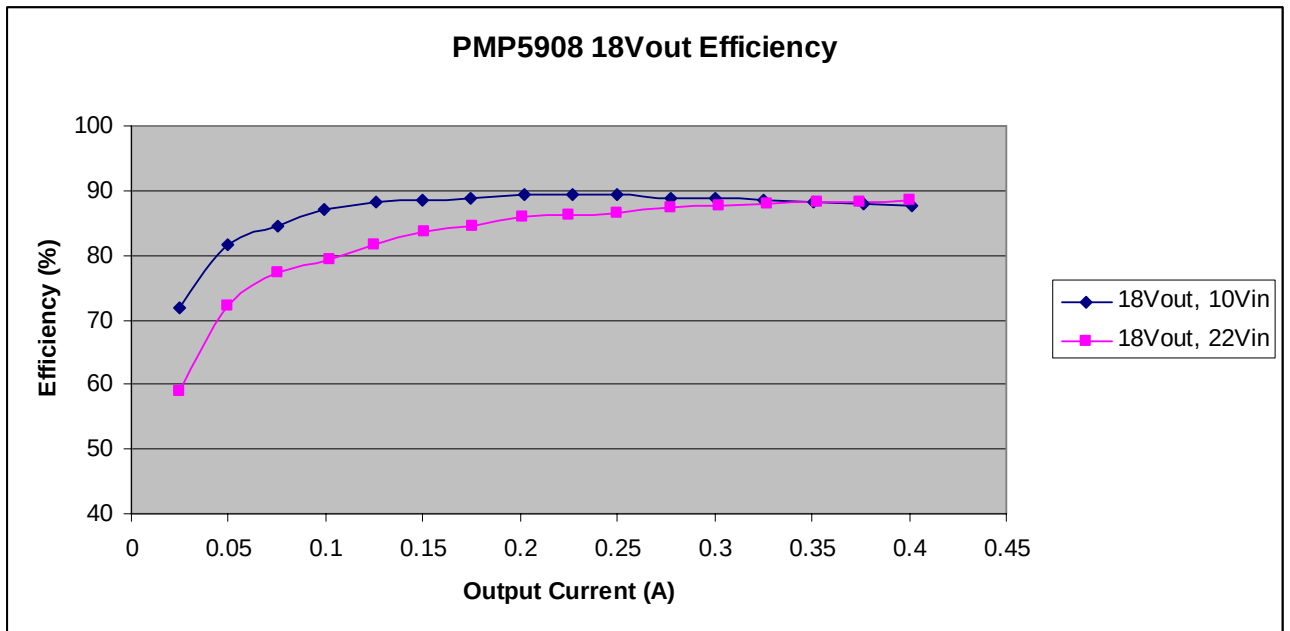
3) Efficiency

PMP5908 Test Report

The SEPIC converter efficiency for the 13.5Vout configuration is shown in the figure below.



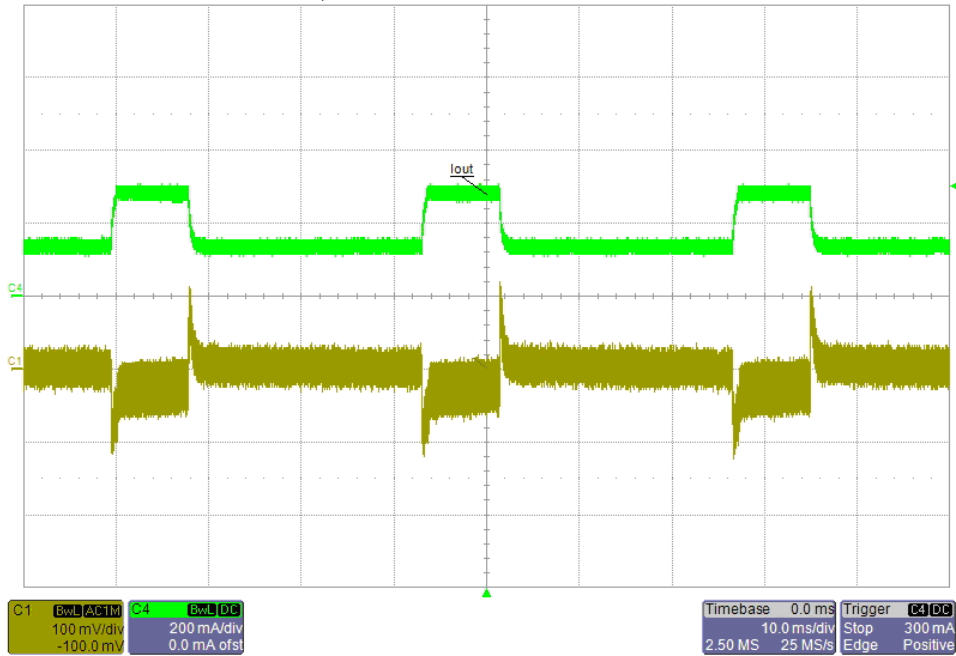
The SEPIC converter efficiency for the 18Vout configuration is shown in the figure below.



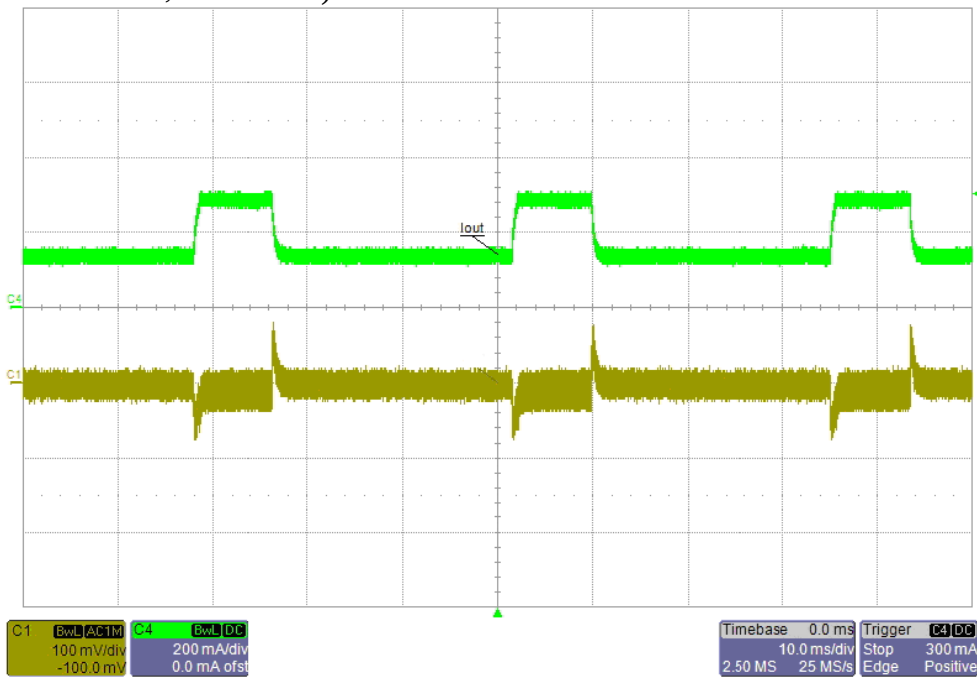
4) Load Transient

PMP5908 Test Report

The plot below shows the response of the 13.5V output voltage (ac coupled) to the load current stepping between 0.2A and 0.4A. $V_{in} = 10V_{dc}$. (100mV/DIV, 200mA/DIV, 10mS/DIV)

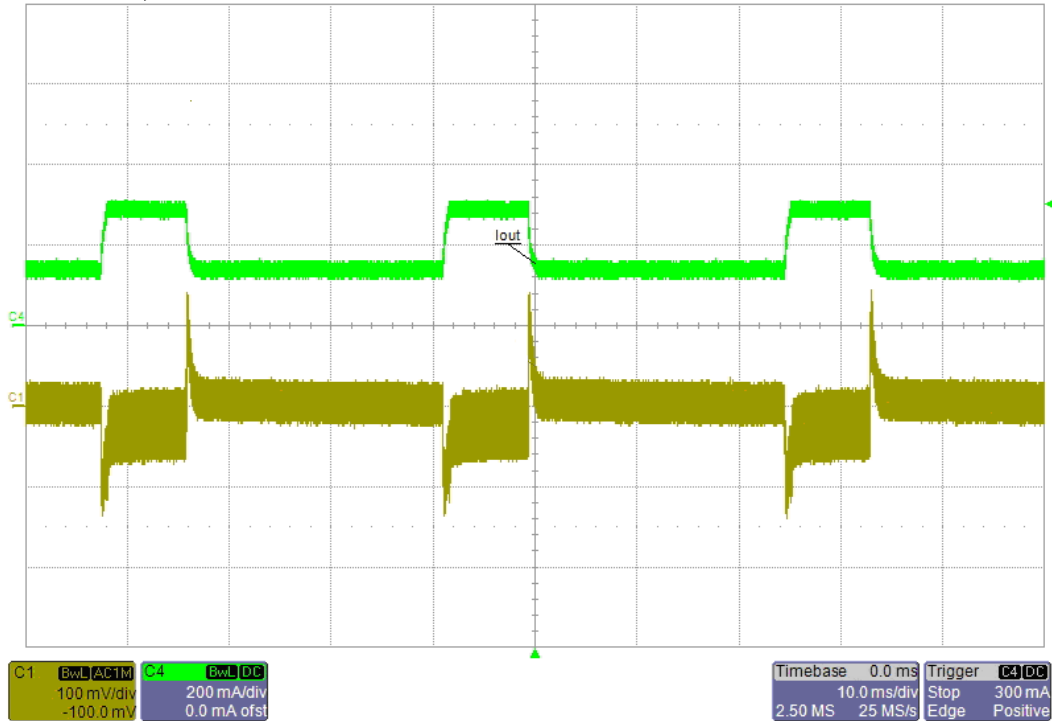


The plot below shows the response of the 13.5V output voltage (ac coupled) to the load current stepping between 0.2A and 0.4A. $V_{in} = 22V_{dc}$. (100mV/DIV, 200mA/DIV, 10mS/DIV)

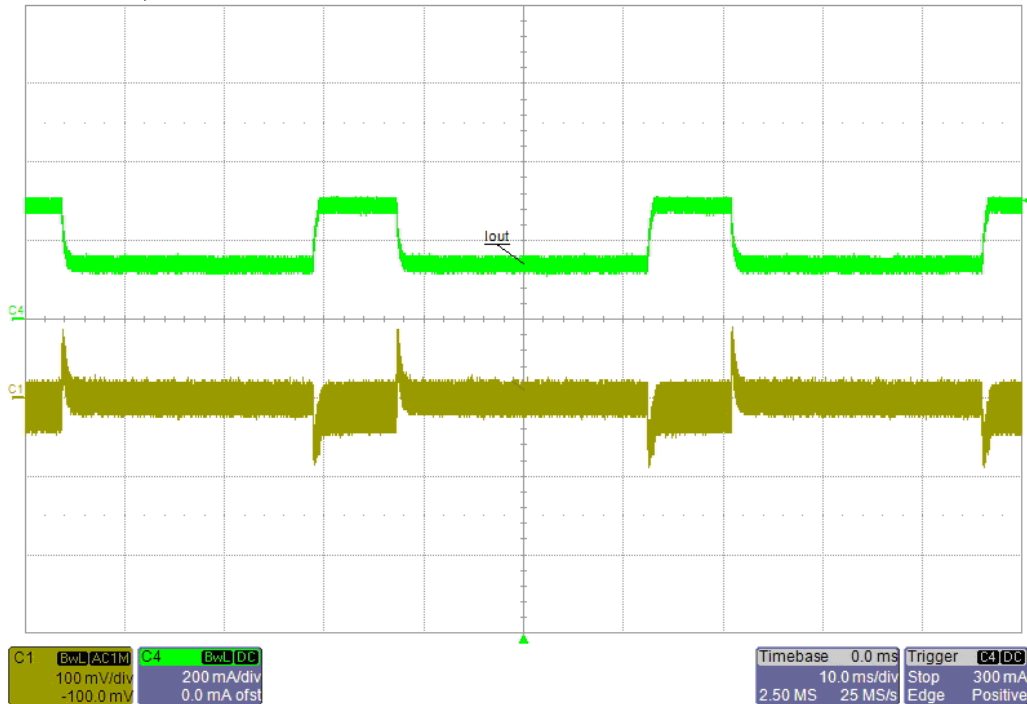


PMP5908 Test Report

The plot below shows the response of the 18V output voltage (ac coupled) to the load current stepping between 0.2A and 0.4A. $V_{in} = 10V_{dc}$. (100mV/DIV, 200mA/DIV, 10mS/DIV)



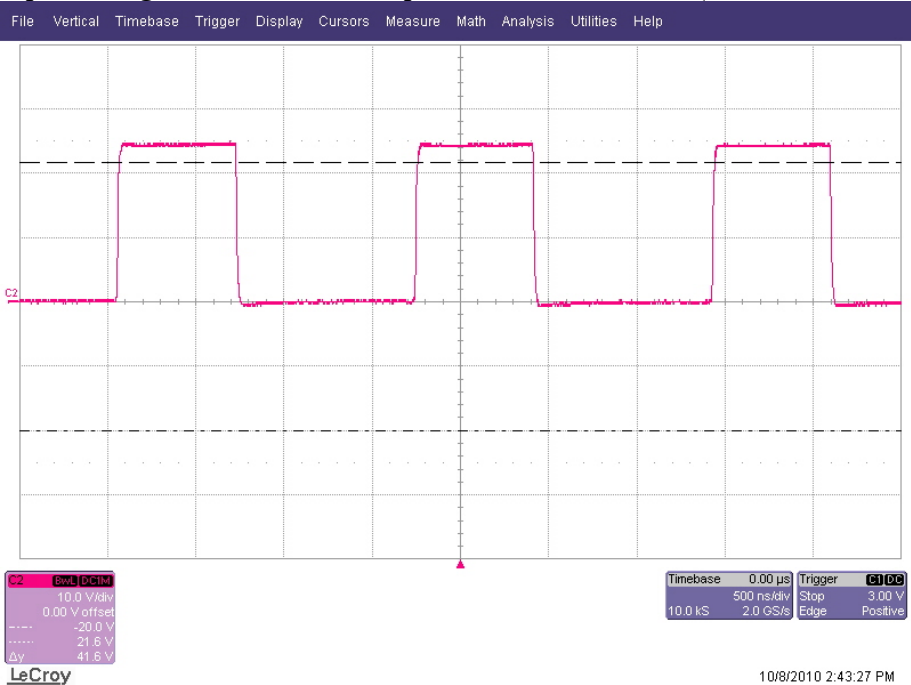
The plot below shows the response of the 18V output voltage (ac coupled) to the load current stepping between 0.2A and 0.4A. $V_{in} = 22V_{dc}$. (100mV/DIV, 200mA/DIV, 10mS/DIV)



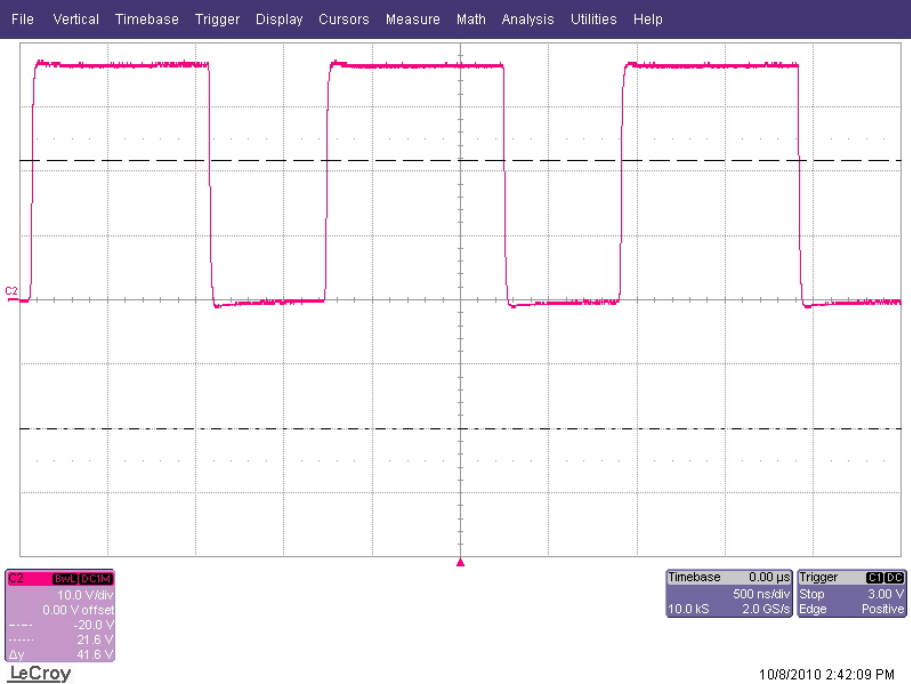
PMP5908 Test Report

5) Switch Node Waveforms

The photos below show the FET drain voltage at TP7 for the 13.5Vout configuration. The input voltage is 10V and the output is loaded to 0.4A. (10V/DIV, 500nS/DIV)

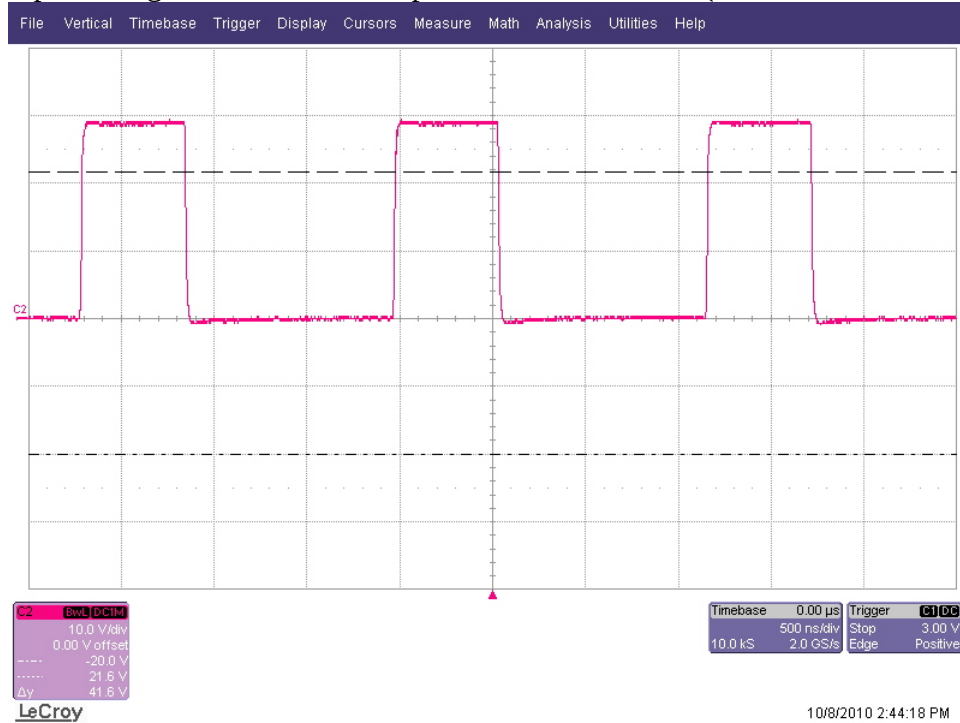


The photos below show the FET drain voltage at TP7 for the 13.5Vout configuration. The input voltage is 22V and the output is loaded to 0.4A. (10V/DIV, 500nS/DIV)

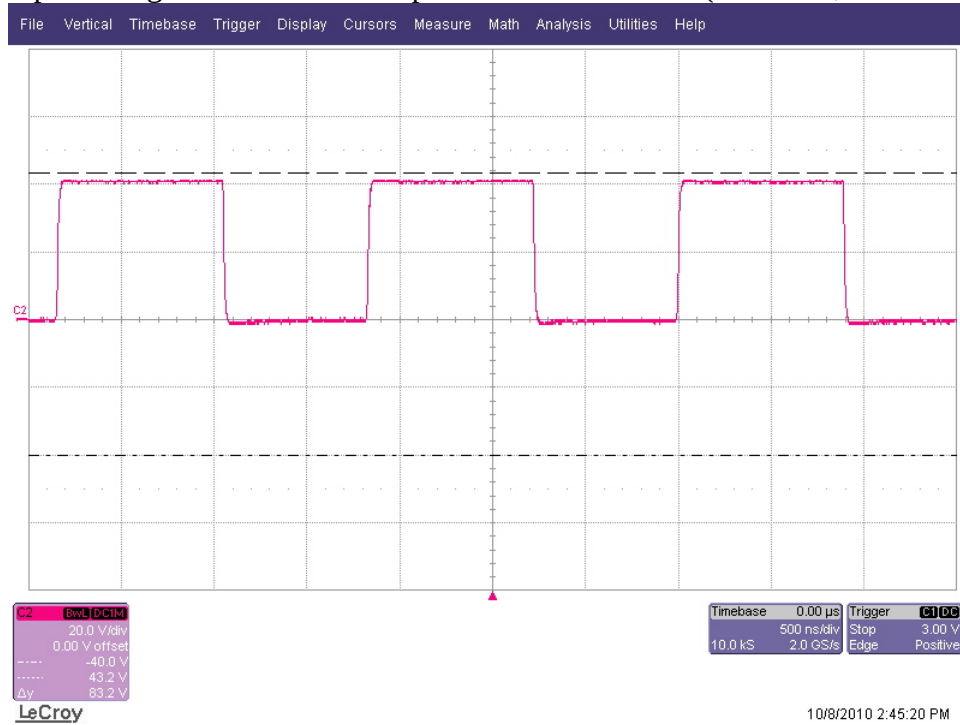


PMP5908 Test Report

The photos below show the FET drain voltage at TP7 for the 18Vout configuration. The input voltage is 10V and the output is loaded to 0.4A. (10V/DIV, 500nS/DIV)



The photos below show the FET drain voltage at TP7 for the 18Vout configuration. The input voltage is 22V and the output is loaded to 0.4A. (20V/DIV, 500nS/DIV)



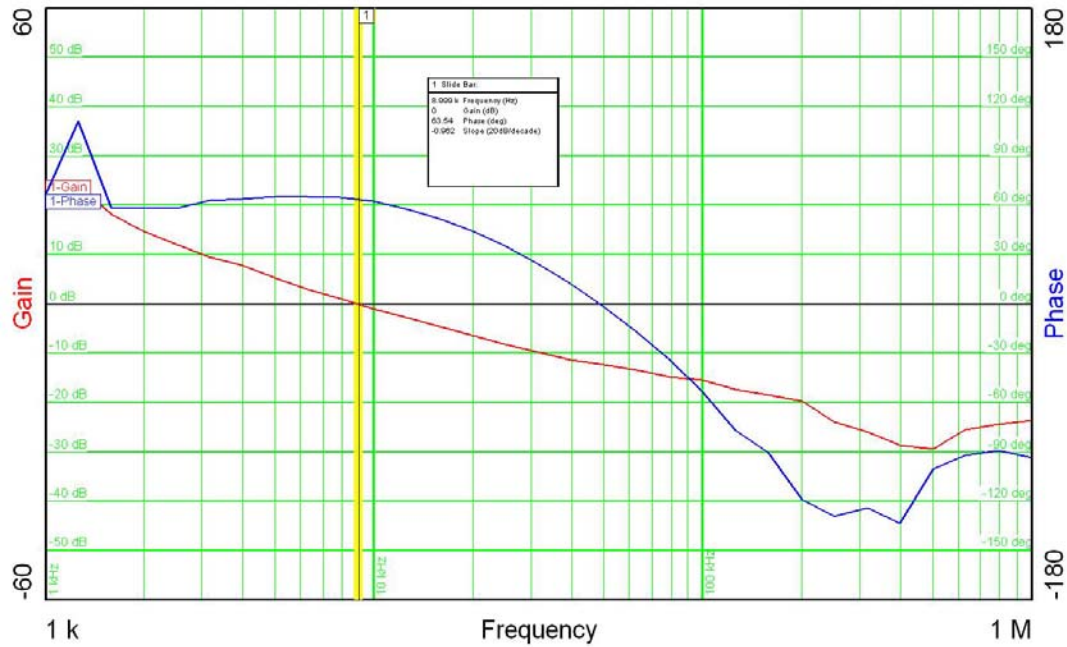
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6) Loop Gain

Closed loop gain; $I_{out} = 0.4A$

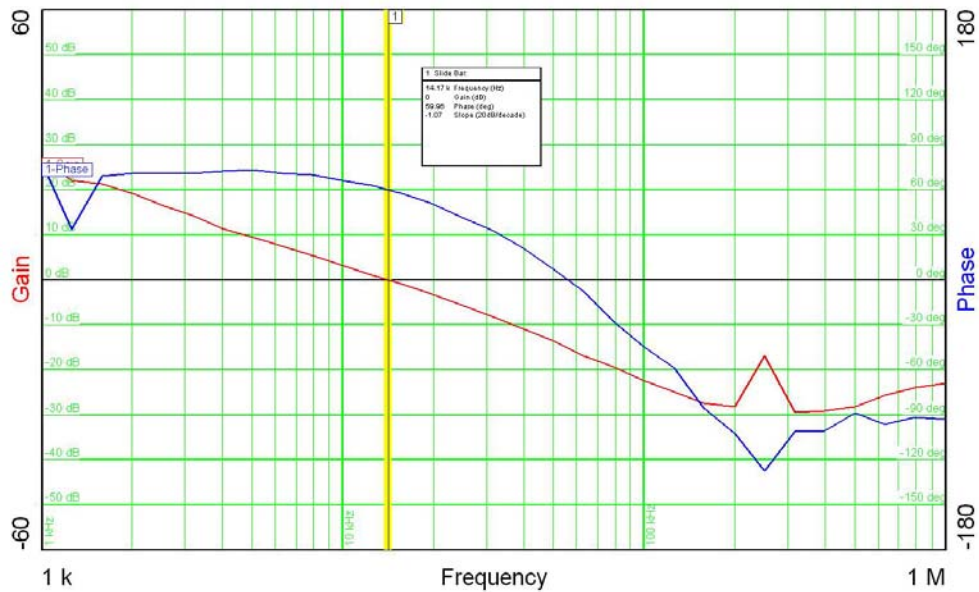
13.5V_{out} Configuration

Bandwidth = 9KHz Phase Margin = 64 degrees ($V_{in} = 10V$)



Bandwidth = 14.17KHz

Phase Margin = 60 degrees ($V_{in} = 22V$)

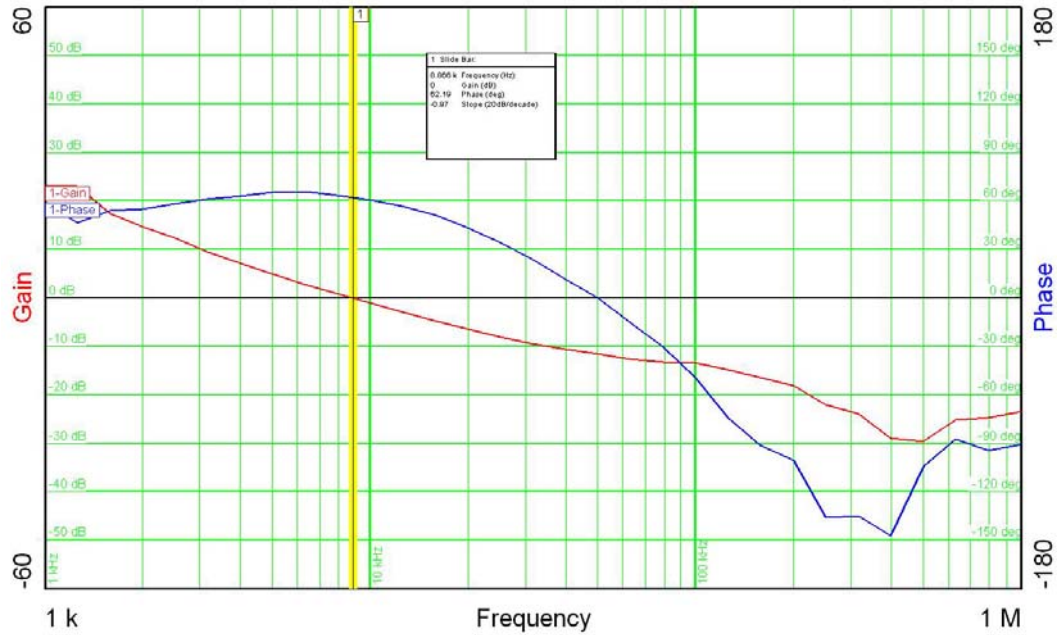


PMP5908 Test Report

Closed loop gain; $I_{out} = 0.4A$

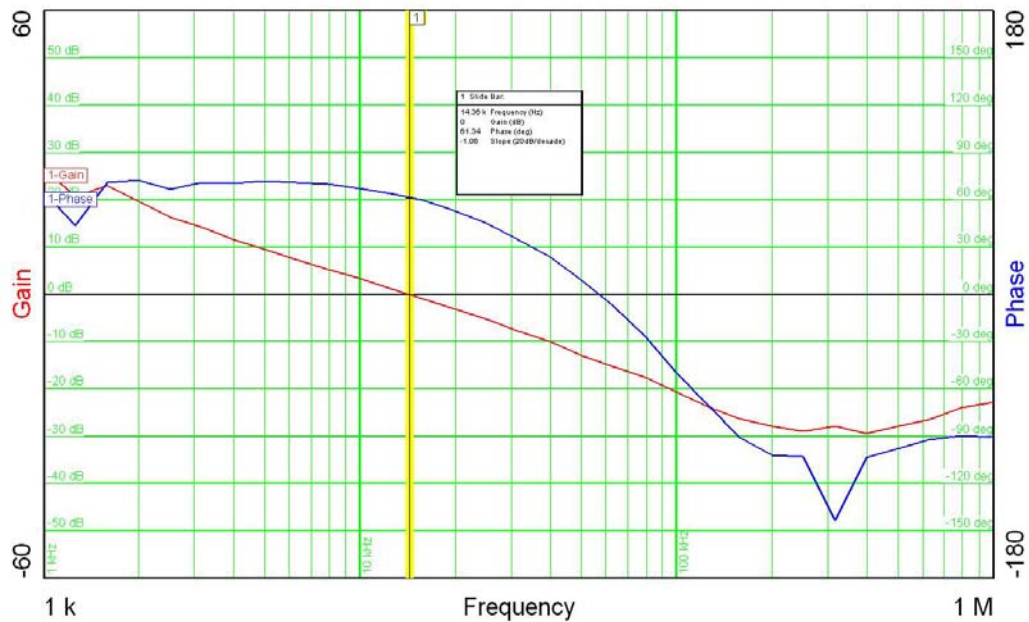
18V_{out} Configuration

Bandwidth = 8.9KHz Phase Margin = 62 degrees ($V_{in} = 10V$)



Bandwidth = 14.36KHz

Phase Margin = 61 degrees ($V_{in} = 22V$)



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