

Efficiency and Regulation

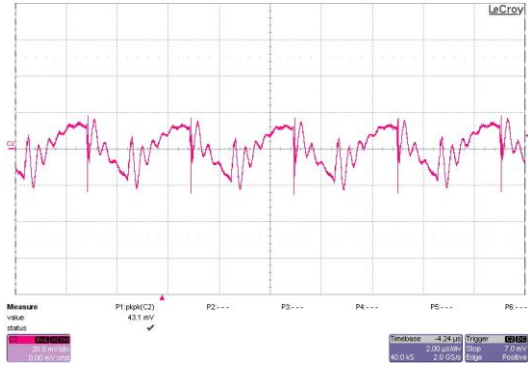
The efficiency and regulation are shown below:

| <u>I_{out}</u> | <u>V_{out}</u> | <u>I_{out}</u> | <u>V_{out}</u> | J3 <u>I_{in}</u> | J3 <u>V_{in}</u> | J3 <u>Eff</u> | |
|--|------------------------|------------------------|------------------------|------------------------------------|------------------------------------|-------------------------|----------|
| 0.000 | 3.349 | 0.000 | 5.012 | 0.0052 | 36.0 | 0.0% | |
| 0.700 | 3.348 | 0.145 | 5.047 | 0.0962 | 36.0 | 88.8% | |
| 0.700 | 3.348 | 0.000 | 5.056 | 0.0742 | 36.0 | 87.7% | |
| 0.000 | 3.349 | 0.145 | 5.002 | 0.0257 | 36.0 | 78.4% | |
| 0.350 | 3.348 | 0.015 | 5.032 | 0.0411 | 36.0 | 84.3% | |
| | | | | | | | |
| <u>I_{out}</u> | <u>V_{out}</u> | <u>I_{out}</u> | <u>V_{out}</u> | J3 <u>I_{in}</u> | J3 <u>V_{in}</u> | J3 <u>Eff</u> | |
| 0.000 | 3.349 | 0.000 | 5.011 | 0.0045 | 48.0 | 0.0% | |
| 0.700 | 3.348 | 0.145 | 5.040 | 0.0720 | 48.0 | 89.0% | |
| 0.700 | 3.348 | 0.000 | 5.048 | 0.0557 | 48.0 | 87.7% | |
| 0.000 | 3.349 | 0.145 | 5.002 | 0.0198 | 48.0 | 76.3% | |
| 0.350 | 3.348 | 0.015 | 5.028 | 0.0312 | 48.0 | 83.3% | |
| | | | | | | | |
| <u>I_{out}</u> | <u>V_{out}</u> | <u>I_{out}</u> | <u>V_{out}</u> | J3 <u>I_{in}</u> | J3 <u>V_{in}</u> | J3 <u>Eff</u> | |
| 0.000 | 3.349 | 0.000 | 5.011 | 0.0042 | 57.0 | 0.0% | |
| 0.700 | 3.348 | 0.145 | 5.037 | 0.0608 | 57.0 | 88.7% | |
| 0.700 | 3.348 | 0.000 | 5.045 | 0.0471 | 57.0 | 87.3% | |
| 0.000 | 3.349 | 0.145 | 5.002 | 0.0170 | 57.0 | 74.8% | |
| 0.350 | 3.348 | 0.015 | 5.026 | 0.0266 | 57.0 | 82.3% | |
| | | | | | | | |
| <u>Max Load Efficiency without bridge</u> | | | | | | | |
| <u>I_{out}</u> | <u>V_{out}</u> | <u>I_{out}</u> | <u>V_{out}</u> | <u>I_{in}</u> | <u>V_{in}</u> | <u>Eff</u> | |
| 0.700 | 3.348 | 0.145 | 5.047 | 0.0962 | 35.49 | 90.1% | 36.0V J3 |
| 0.700 | 3.348 | 0.145 | 5.040 | 0.0720 | 47.55 | 89.8% | 48.0V J3 |
| 0.700 | 3.348 | 0.145 | 5.037 | 0.0608 | 56.55 | 89.4% | 57.0V J3 |
| | | | | | | | |
| Vin measured at FB1/FB2 | | | | | | | |

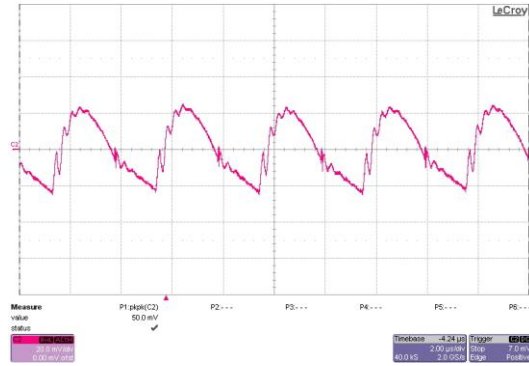
Ripple and Noise

48V input; 3.3V/700mA, 5V/145mA loads; 20MHz BWL.

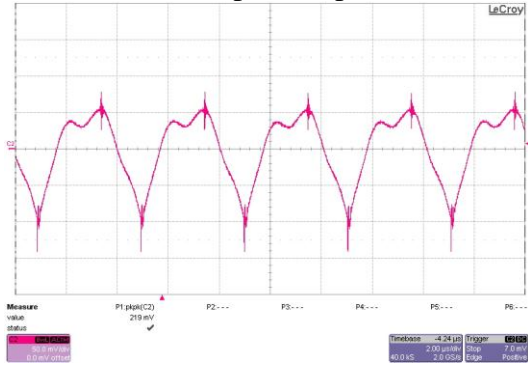
3.3V Output Ripple (C29), 20mV/div
Measured 43mV peak to peak:



5V Output Ripple (C19), 20mV/div
Measured 50mV peak to peak:

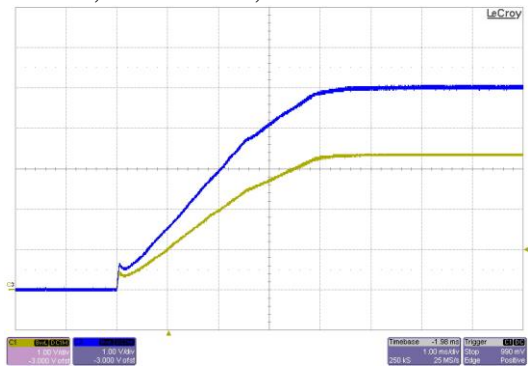


Input Ripple (C21), 50mV/div
Measured 219mV peak to peak:

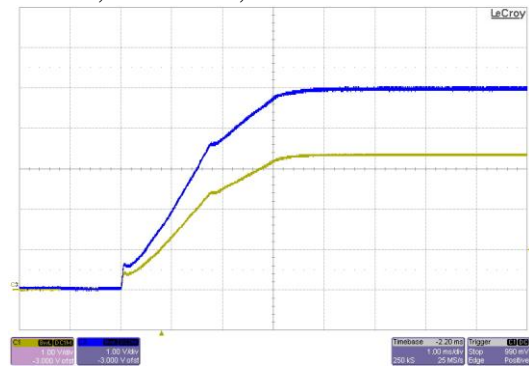


Turn On Response

48VIN, Max Loads, 1msec/div:



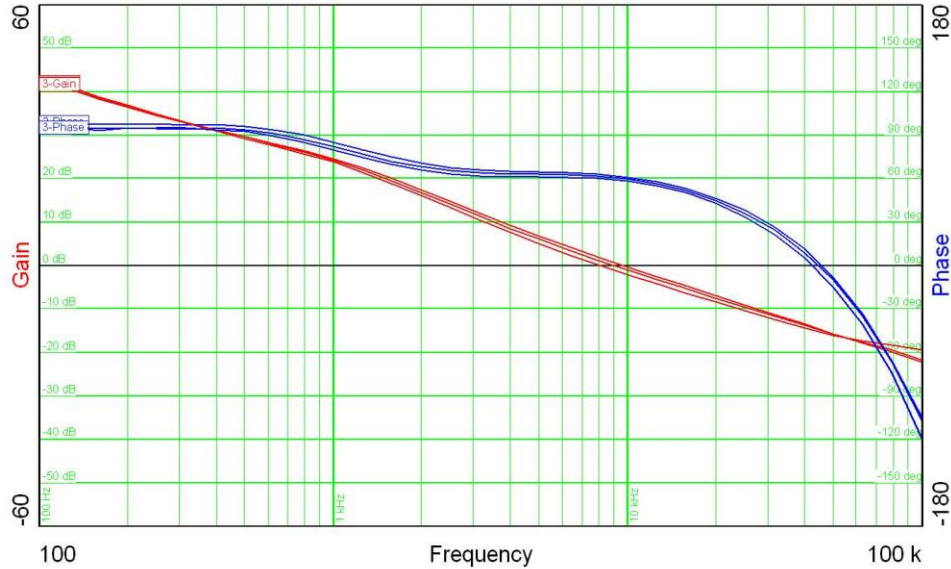
48VIN, 0A Loads, 1msec.div:



Top, 5V output, 1V/div; Bottom, 3.3V output, 1V/div

Loop Stability

The measured Bode plot of the converter is shown below.



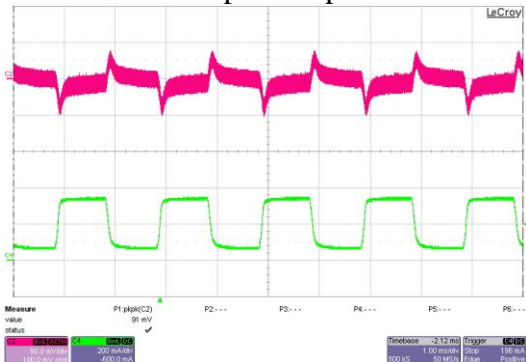
| Volts | KHz | Degrees | dB |
|------------|-----------|-----------|-----------|
| <u>Vin</u> | <u>BW</u> | <u>PM</u> | <u>GM</u> |
| 36.0 | 8.0 | 60 | 14.8 |
| 48.0 | 8.9 | 60 | 14.7 |
| 57.0 | 9.6 | 61 | 14.8 |

Dynamic Loading

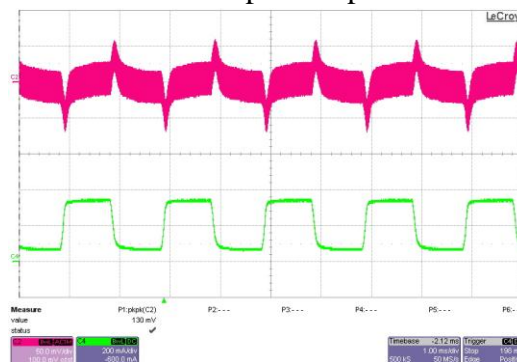
One output at a time was pulsed. The output not being pulsed was loaded to its maximum value. The input voltage is 48V at J3.

3.3V load step, 70mA to 350mA:

3.3V Response
 50mV/div, 1msec/div
 Measured 91mV peak to peak:

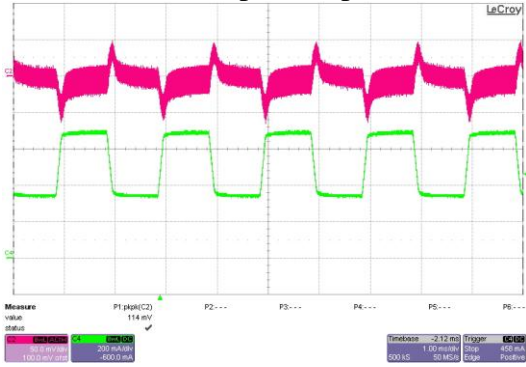


5V Response
 50mV/div
 Measured 130mV peak to peak:

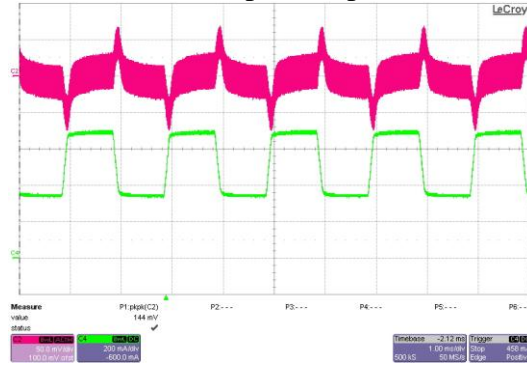


3.3V load step, 350mA to 700mA:

3.3V Response; 50mV/div, 1msec/div
Measured 114mV peak to peak:

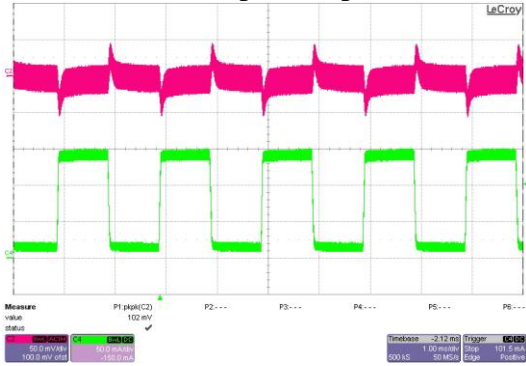


5V Response; 50mV/div, 1msec/div
Measured 144mV peak to peak:

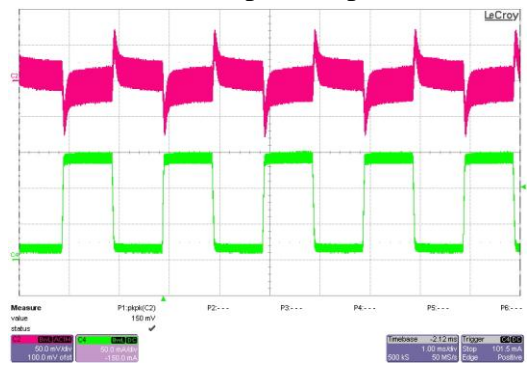


5V load step, 15mA to 145mA:

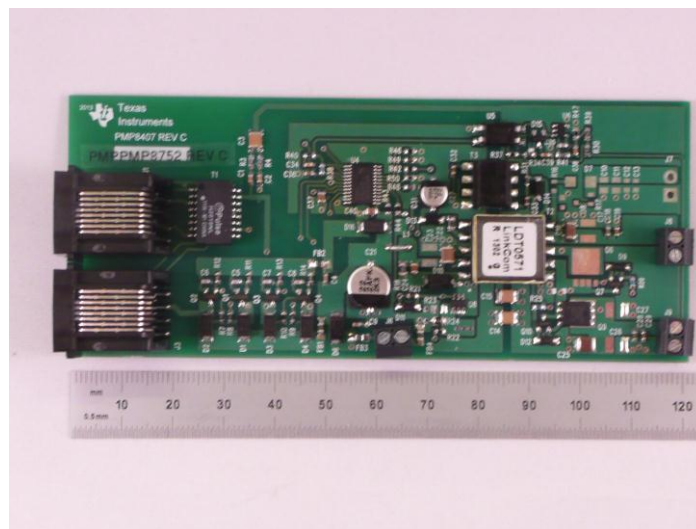
3.3V Response; 50mV/div, 1msec/div
Measured 102mV peak to peak:



5V Response; 50mV/div, 1msec/div
Measured 150mV peak to peak:



Photo



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