Efficiency and Regulation

The efficiency and regulation are shown below:

						J3	J3	J3	
Iout	Vout	Iout	Vout	Iout	Vout	Iin	Vin	Eff	
0.00	3.330	0.00	4.994	0.000	10.135	0.0064	36.0	0.0%	
1.50	3.328	0.00	5.102	0.000	10.442	0.1579	36.0	87.8%	
0.00	3.330	1.00	4.959	0.200	9.570	0.2145	36.0	89.0%	
1.50	3.328	1.00	5.066	0.200	9.862	0.3864	36.0	86.5%	
1.50	3.328	1.00	5.070	0.000	10.889	0.3223	36.0	86.7%	
0.75	3.329	0.50	5.029	0.100	9.749	0.1861	36.0	89.4%	
						J3	J3	J3	
Iout	Vout	Iout	Vout	Iout	Vout	Iin	Vin	Eff	
0.00	3.330	0.00	4.993	0.000	10.144	0.0056	48.0	0.0%	
1.50	3.328	0.00	5.083	0.000	10.365	0.1174	48.0	88.6%	
0.00	3.330	1.00	4.964	0.200	9.577	0.1593	48.0	90.0%	
1.50	3.328	1.00	5.054	0.200	9.825	0.2815	48.0	88.9%	
1.50	3.328	1.00	5.056	0.000	10.742	0.2354	48.0	88.9%	
0.75	3.329	0.50	5.023	0.100	9.732	1.3830	48.0	9.0%	
						J3	J3	J3	
Iout	Vout	Iout	Vout	Iout	Vout	Iin	Vin	Eff	
0.00	3.330	0.00	4.993	0.000	10.161	0.0053	57.0	0.0%	
1.50	3.328	0.00	5.075	0.000	10.322	0.0988	57.0	88.6%	
0.00	3.330	1.00	4.966	0.200	9.581	0.1340	57.0	90.1%	
1.50	3.328	1.00	5.048	0.200	9.808	0.2345	57.0	89.8%	
1.50	3.328	1.00	5.051	0.000	10.672	0.1965	57.0	89.7%	
0.75	3.329	0.50	5.020	0.100	9.725	0.1165	57.0	90.0%	
Max Load Efficiency without bridge									
Iout	Vout	Iout	Vout	Iout	Vout	Iin	Vin	Eff	
1.50	3.328	1.00	5.066	0.200	9.862	0.3864	35.03	88.9%	36.0V at J3
1.50	3.328	1.00	5.054	0.200	9.825	0.2815	47.19	90.4%	48.0V at J3
1.50	3.328	1.00	5.048	0.200	9.808	0.2345	56.16	91.1%	57.0V at J3
Vin measured at FB1/FB2									

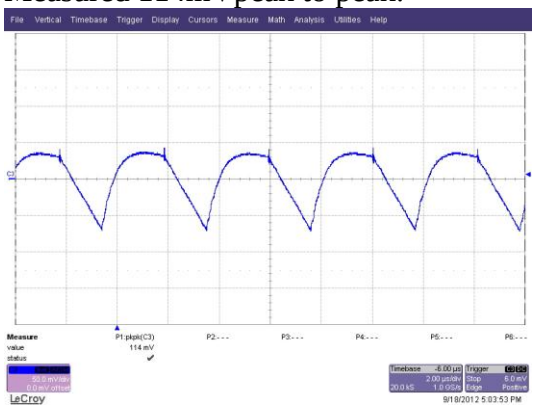
Ripple and Noise

48V input; 3.3V/1.5A, 5V/1A, and 10V/200mA loads; 20MHz BWL.

3.3V Output Ripple (C29), 50mV/div
Measured 45mVpeak to peak:

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

10V Output Ripple (C13), 50mV/div
Measured 114mVpeak to peak:



Turn On Response

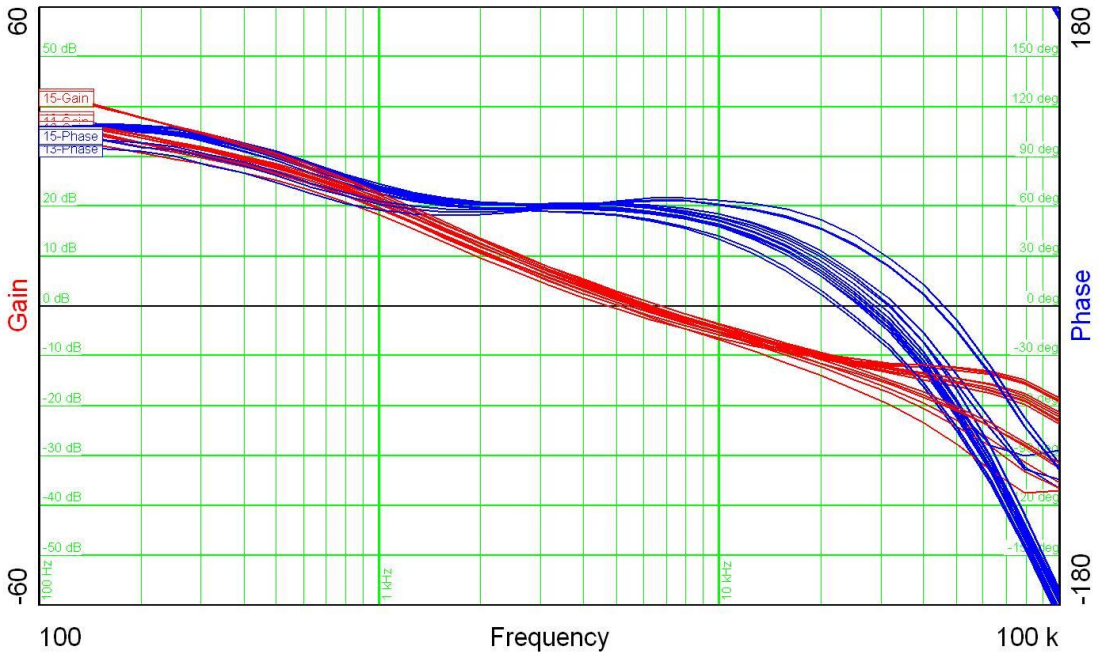
48VIN, Max Loads, 1msec/div:

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

Top, 5V output, 1V/div; Middle, 3.3V output, 1V/div; Bottom, 10V output, 5V/div

Loop Stability

The measured Bode plot of the converter is shown below.



Bandwidth, Phase Margin, and Gain Margin Data

(Volts)	(Amps)	(Amps)	(Amps)	(KHz)	(Degrees)	(dB)
VIN	**3.3VI**	**5VI**	**10VI**	**BW**	**PM**	**GM**
36.0	1.50	1.00	0.200	4.7	54	11
36.0	0.00	1.00	0.200	5.0	58	17
36.0	1.50	0.00	0.200	5.1	57	11
36.0	1.50	1.00	0.000	5.4	54	10
36.0	0.00	0.00	0.000	5.7	64	20
48.0	1.50	1.00	0.200	5.4	57	12
48.0	0.00	1.00	0.200	5.7	60	17
48.0	1.50	0.00	0.200	5.8	58	12
48.0	1.50	1.00	0.000	6.2	57	11
48.0	0.00	0.00	0.000	6.3	63	18
57.0	1.50	1.00	0.200	5.9	59	12
57.0	0.00	1.00	0.200	6.1	61	17
57.0	1.50	0.00	0.200	6.2	61	13
57.0	1.50	1.00	0.000	6.7	58	12
57.0	0.00	0.00	0.000	6.7	63	18

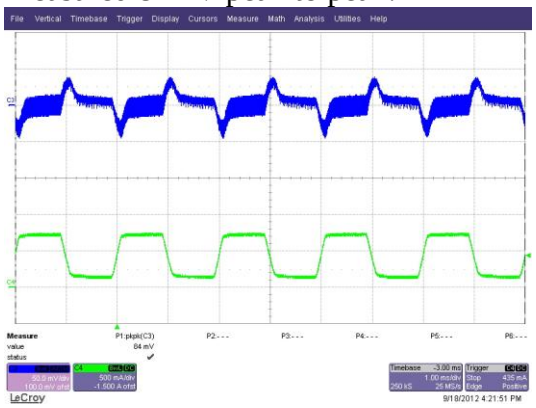
Dynamic Loading

One output at a time was pulsed. The outputs not being pulsed were loaded to their maximum value.

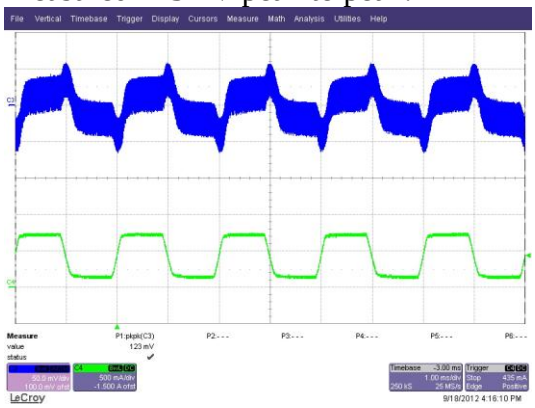
36V INPUT

3.3V load step, 150mA to 750mA:

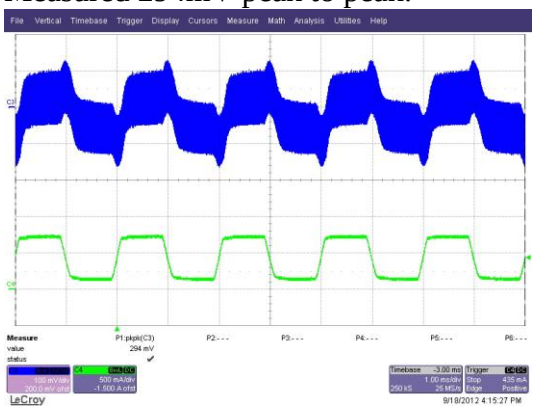
3.3V Response
50mV/div, 1msec/div
Measured 84mV peak to peak:



5V Response
50mV/div
Measured 123mV peak to peak:

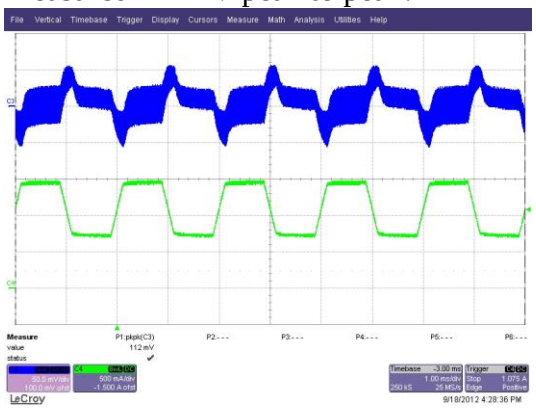


10V Response
100mV/div, 1msec/div
Measured 294mV peak to peak:

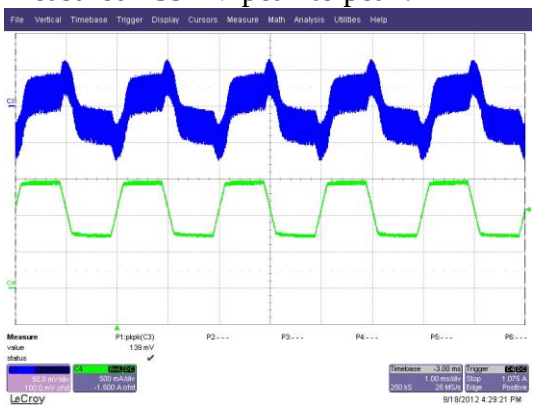


3.3V load step, 750mA to 1.5A:

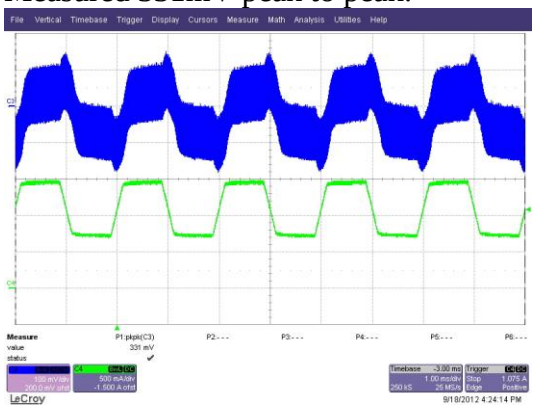
3.3V Response
50mV/div, 1msec/div
Measured 112mV peak to peak:



5V Response
50mV/div
Measured 139mV peak to peak:

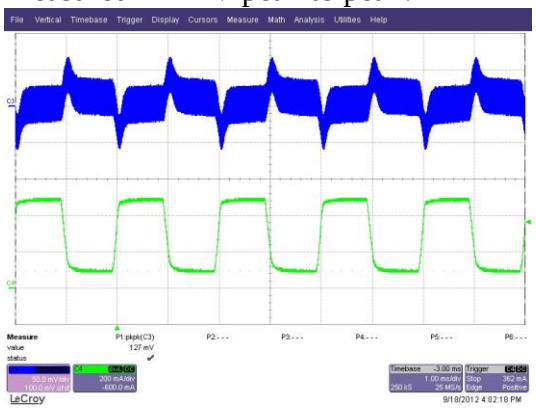


10V Response
100mV/div, 1msec/div
Measured 331mV peak to peak:

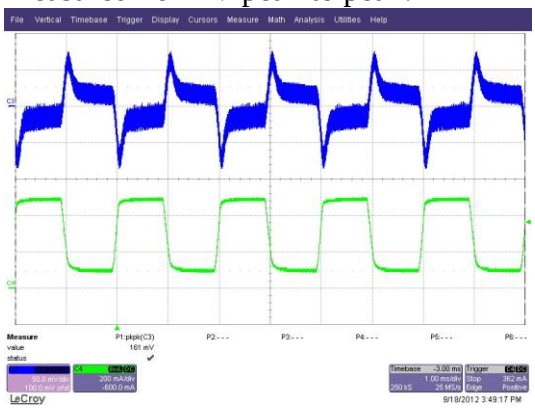


5V load step, 100mA to 500mA:

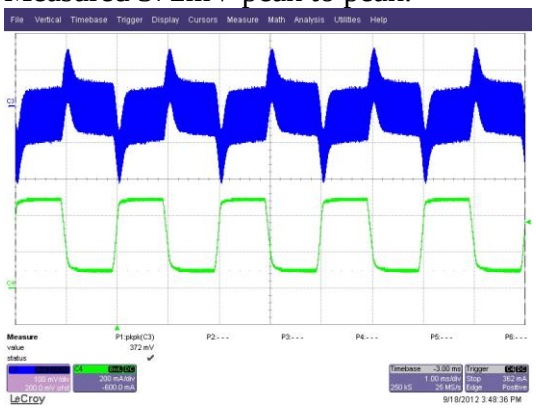
3.3V Response
50mV/div, 1msec/div
Measured 127mV peak to peak:



5V Response
50mV/div
Measured 161mV peak to peak:

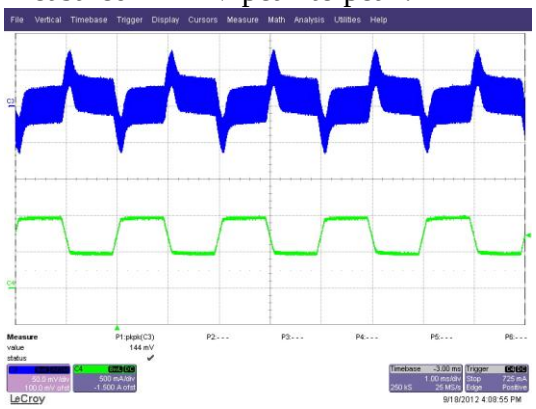


10V Response
100mV/div, 1msec/div
Measured 372mV peak to peak:

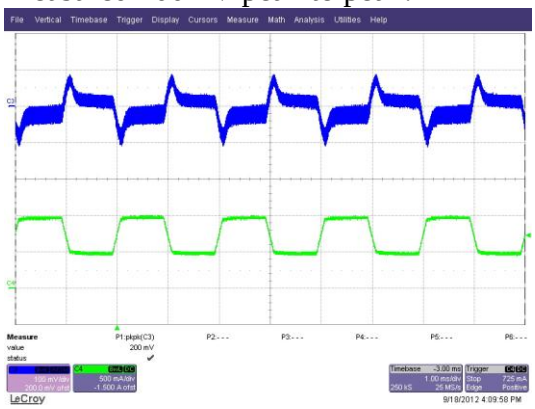


5V load step, 500mA to 1A:

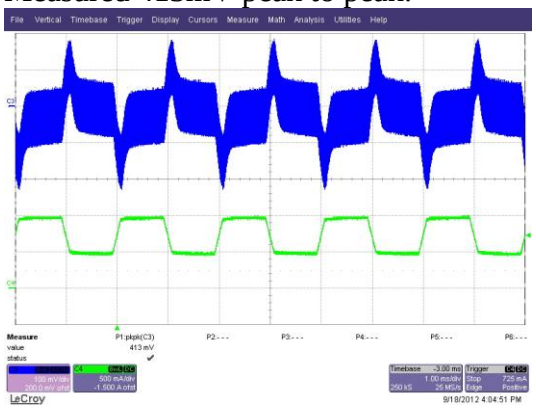
3.3V Response
50mV/div, 1msec/div
Measured 144mV peak to peak:



5V Response
50mV/div
Measured 200mV peak to peak:



10V Response
100mV/div, 1msec/div
Measured 413mV peak to peak:

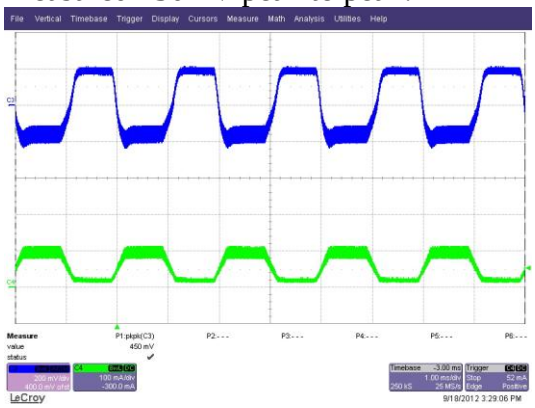


10V load step, 20mA to 100mA:

3.3V Response
50mV/div, 1msec/div
Measured xxmV peak to peak:
(No significant variation higher than switching frequency ripple)

5V Response
50mV/div
Measured xxmV peak to peak:
(No significant variation higher than switching frequency ripple)

10V Response
50mV/div, 1msec/div
Measured 450mV peak to peak:



10V load step, 100mA to 200mA:

3.3V Response
100mV/div, 1msec/div
Measured xxmV peak to peak:
(No significant variation higher than switching frequency ripple)

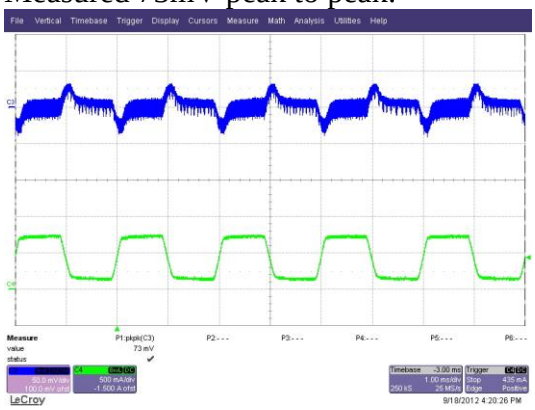
5V Response
50mV/div
Measured xxmV peak to peak:
(No significant variation higher than switching frequency ripple)

10V Response
100mV/div, 1msec/div
Measured 275mV peak to peak:

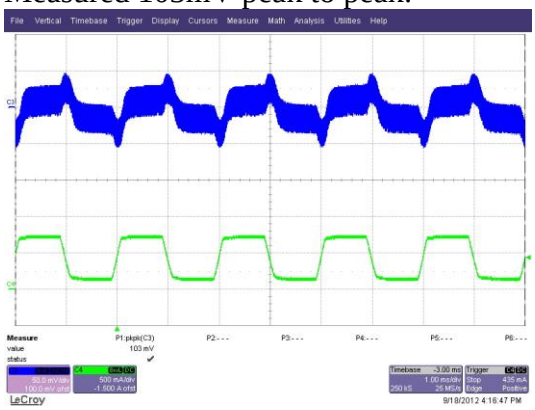
48V INPUT

3.3V load step, 150mA to 750mA:

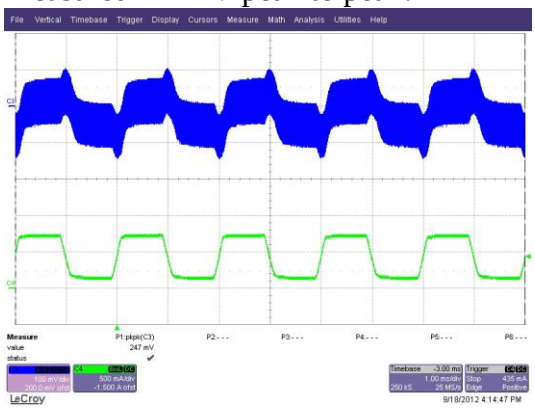
3.3V Response
50mV/div, 1msec/div
Measured 73mV peak to peak:



5V Response
50mV/div
Measured 103mV peak to peak:

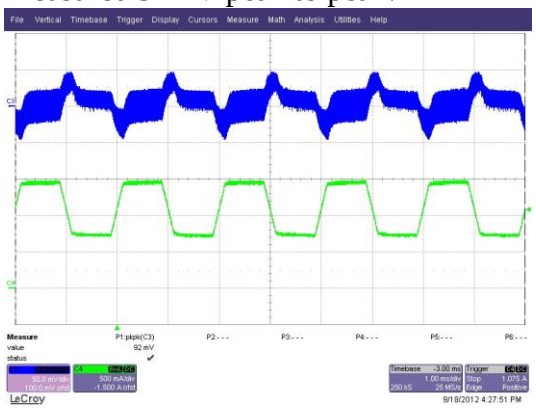


10V Response
100mV/div, 1msec/div
Measured 247mV peak to peak:

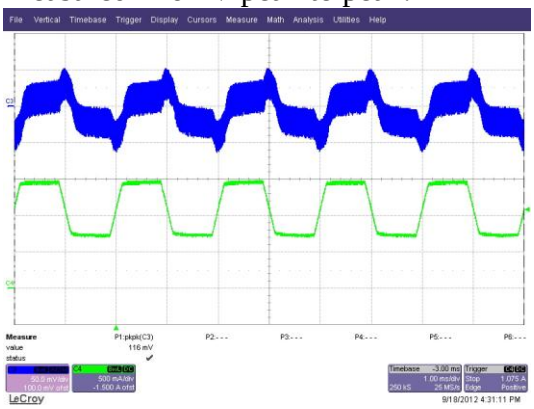


3.3V load step, 750mA to 1.5A:

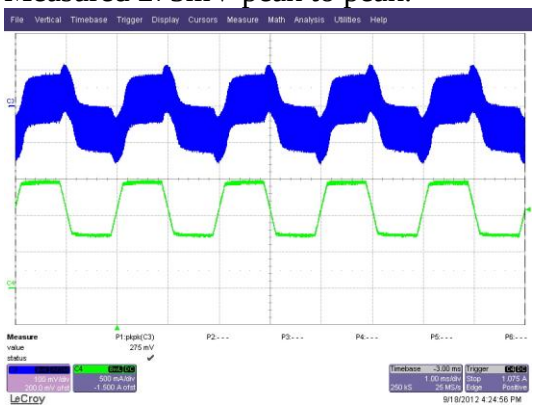
3.3V Response
50mV/div, 1msec/div
Measured 92mV peak to peak:



5V Response
50mV/div
Measured 116mV peak to peak:

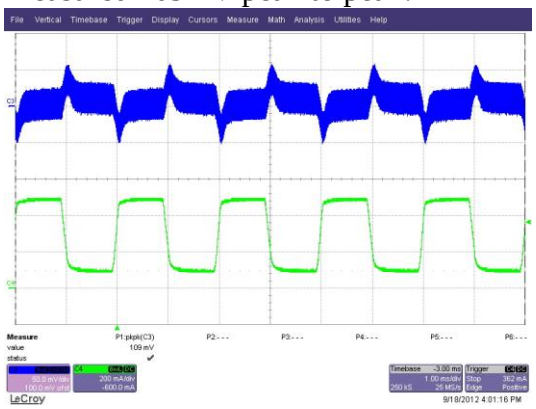


10V Response
100mV/div, 1msec/div
Measured 275mV peak to peak:

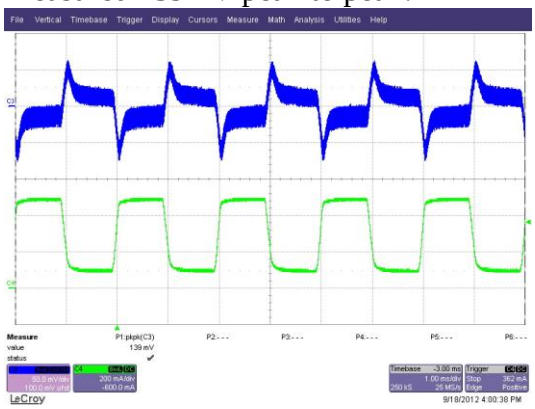


5V load step, 100mA to 500mA:

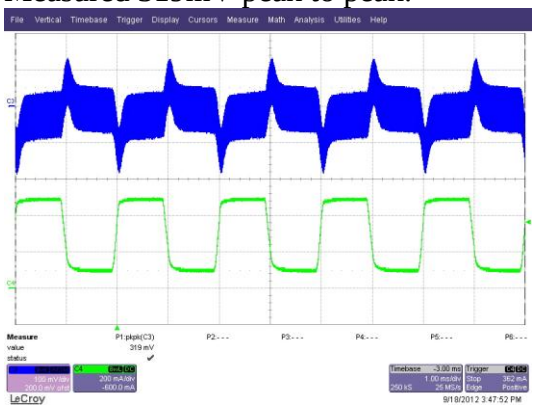
3.3V Response
50mV/div, 1msec/div
Measured 109mV peak to peak:



5V Response
50mV/div
Measured 139mV peak to peak:

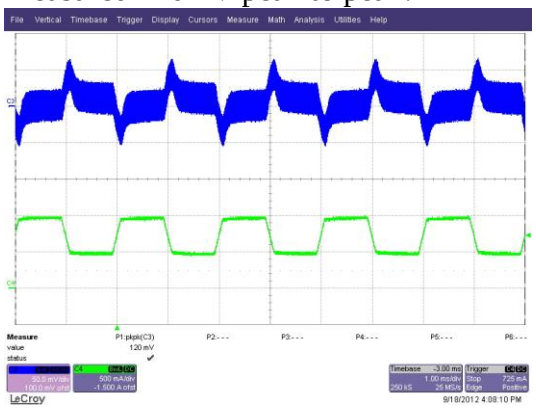


10V Response
100mV/div, 1msec/div
Measured 319mV peak to peak:

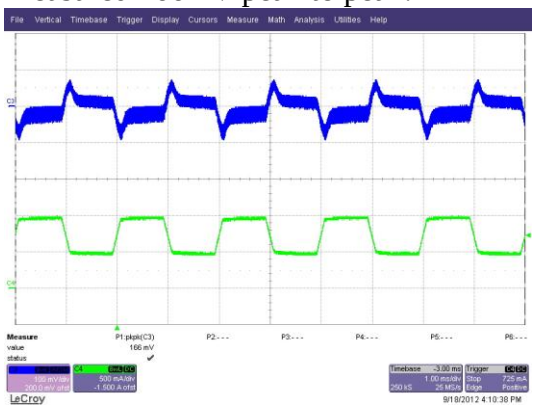


5V load step, 500mA to 1A:

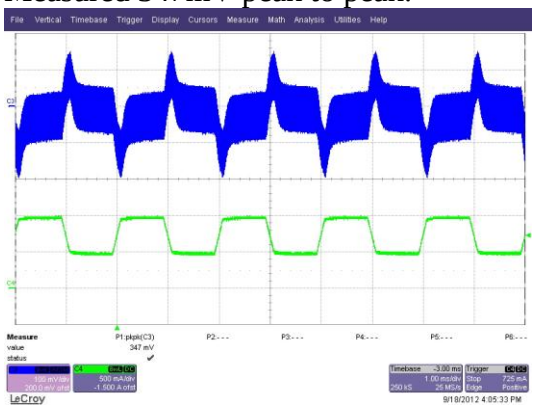
3.3V Response
50mV/div, 1msec/div
Measured 120mV peak to peak:



5V Response
50mV/div
Measured 166mV peak to peak:



10V Response
100mV/div, 1msec/div
Measured 347mV peak to peak:

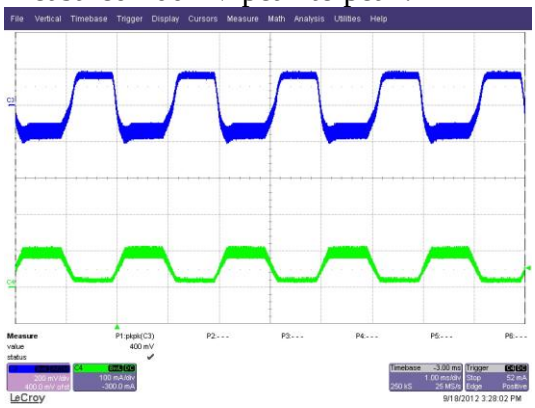


10V load step, 20mA to 100mA:

3.3V Response
50mV/div, 1msec/div
Measured xxmV peak to peak:
(No significant variation higher than switching frequency ripple)

5V Response
50mV/div
Measured xxmV peak to peak:
(No significant variation higher than switching frequency ripple)

10V Response
100mV/div, 1msec/div
Measured 400mV peak to peak:

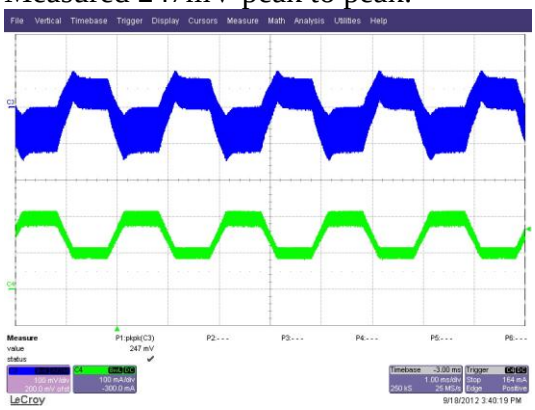


10V load step, 100mA to 200mA:

3.3V Response
100mV/div, 1msec/div
Measured xxmV peak to peak:
(No significant variation higher than switching frequency ripple)

5V Response
50mV/div
Measured xxmV peak to peak:
(No significant variation higher than switching frequency ripple)

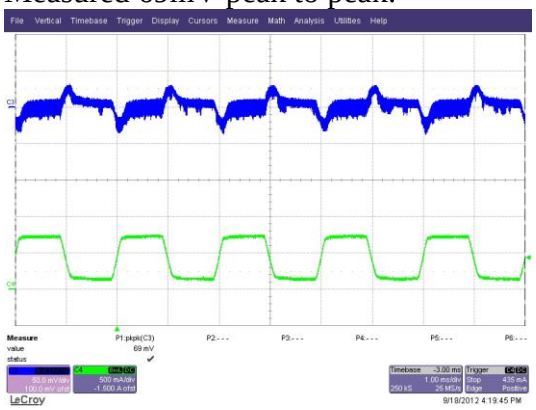
10V Response
100mV/div, 1msec/div
Measured 247mV peak to peak:



57V INPUT

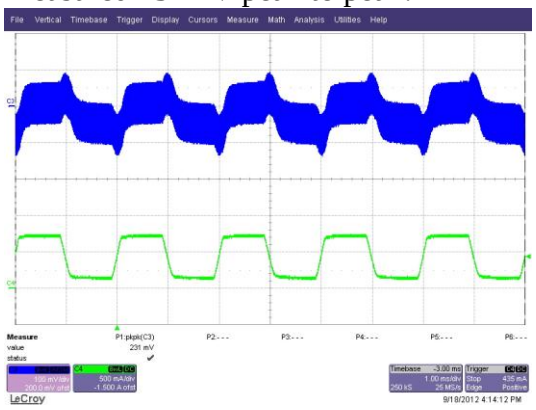
3.3V load step, 150mA to 750mA:

3.3V Response
50mV/div, 1msec/div
Measured 69mV peak to peak:



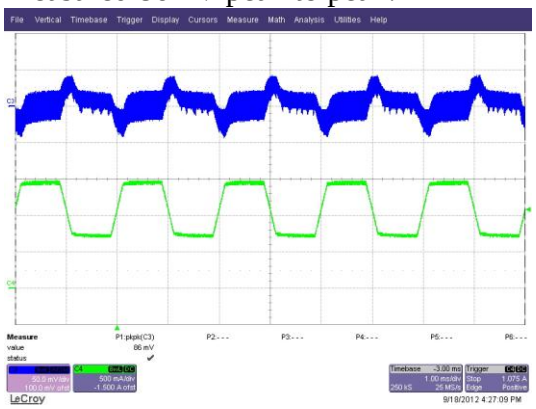
5V Response
50mV/div
Measured 94mV peak to peak:

10V Response
100mV/div, 1msec/div
Measured 231mV peak to peak:

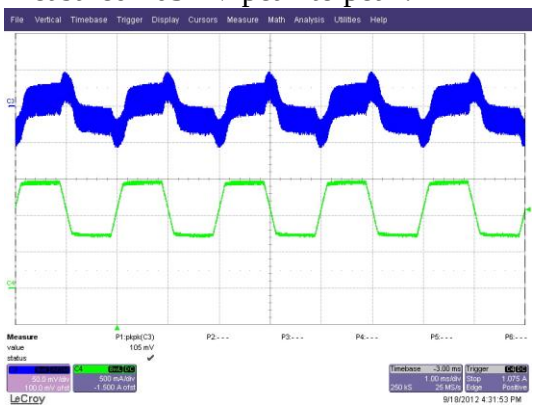


3.3V load step, 750mA to 1.5A:

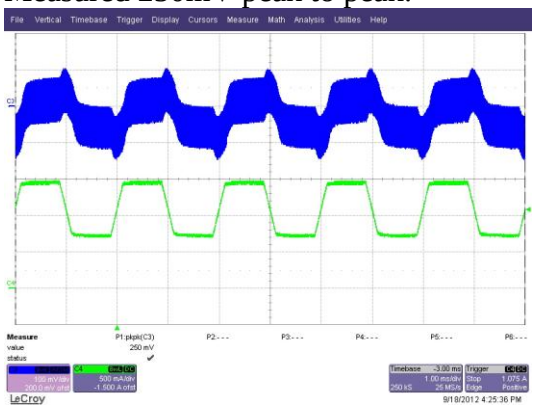
3.3V Response
50mV/div, 1msec/div
Measured 86mV peak to peak:



5V Response
50mV/div
Measured 105mV peak to peak:

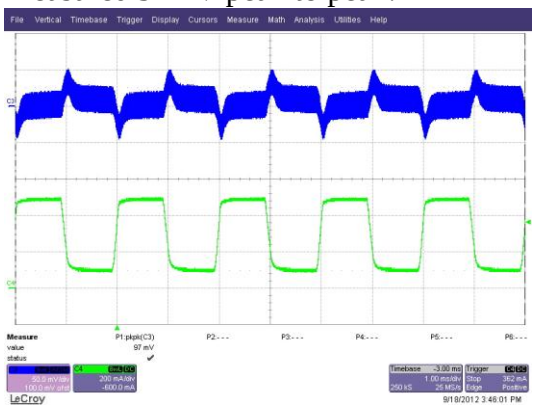


10V Response
100mV/div, 1msec/div
Measured 250mV peak to peak:

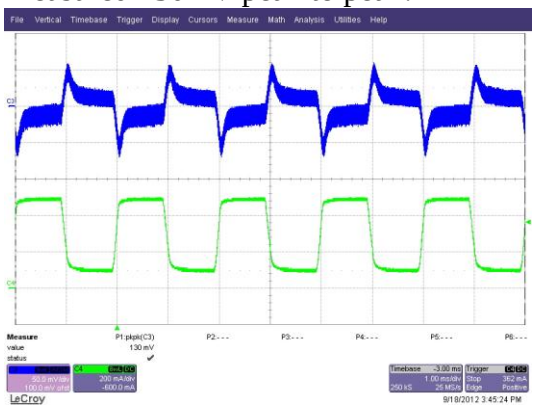


5V load step, 100mA to 500mA:

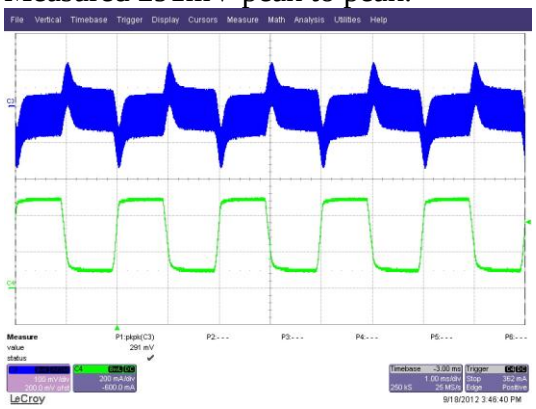
3.3V Response
50mV/div, 1msec/div
Measured 97mV peak to peak:



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

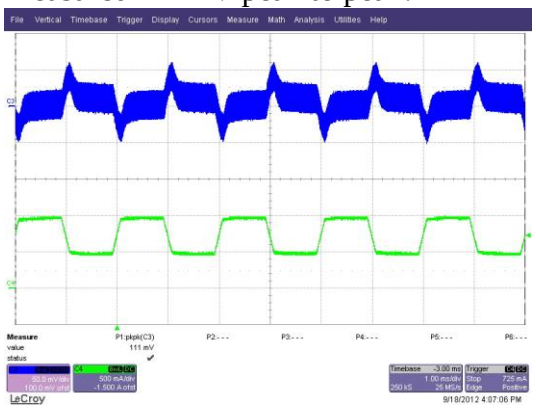


10V Response
100mV/div, 1msec/div
Measured 291mV peak to peak:

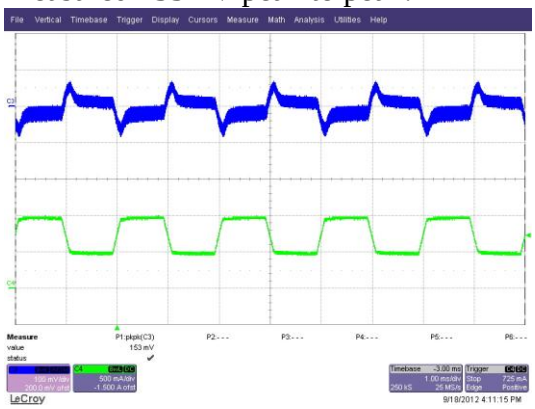


5V load step, 500mA to 1A:

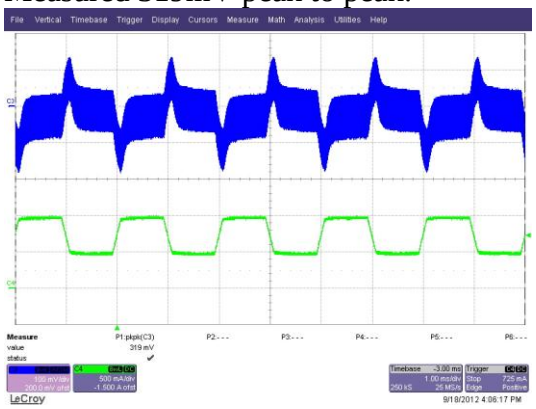
3.3V Response
50mV/div, 1msec/div
Measured 111mV peak to peak:



5V Response
50mV/div
Measured 153mV peak to peak:



10V Response
100mV/div, 1msec/div
Measured 319mV peak to peak:

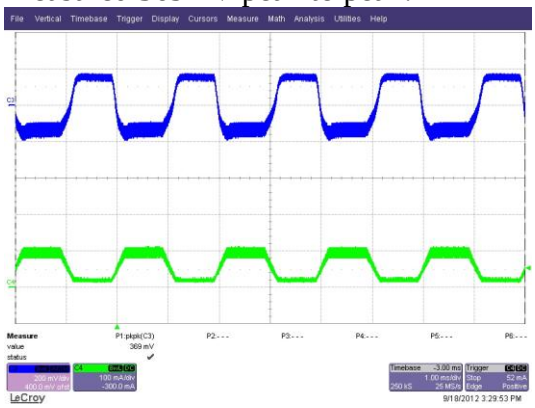


10V load step, 20mA to 100mA:

3.3V Response
50mV/div, 1msec/div
Measured xxmV peak to peak:
(No significant variation higher than switching frequency ripple)

5V Response
50mV/div
Measured xxmV peak to peak:
(No significant variation higher than switching frequency ripple)

10V Response
100mV/div, 1msec/div
Measured 369mV peak to peak:



10V load step, 100mA to 200mA:

3.3V Response
100mV/div, 1msec/div
Measured xxmV peak to peak:
(No significant variation higher than switching frequency ripple)

5V Response
50mV/div
Measured xxmV peak to peak:
(No significant variation higher than switching frequency ripple)

10V Response
100mV/div, 1msec/div
Measured 234mV peak to peak:

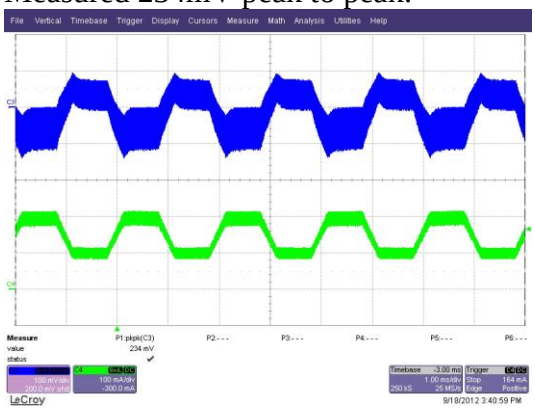
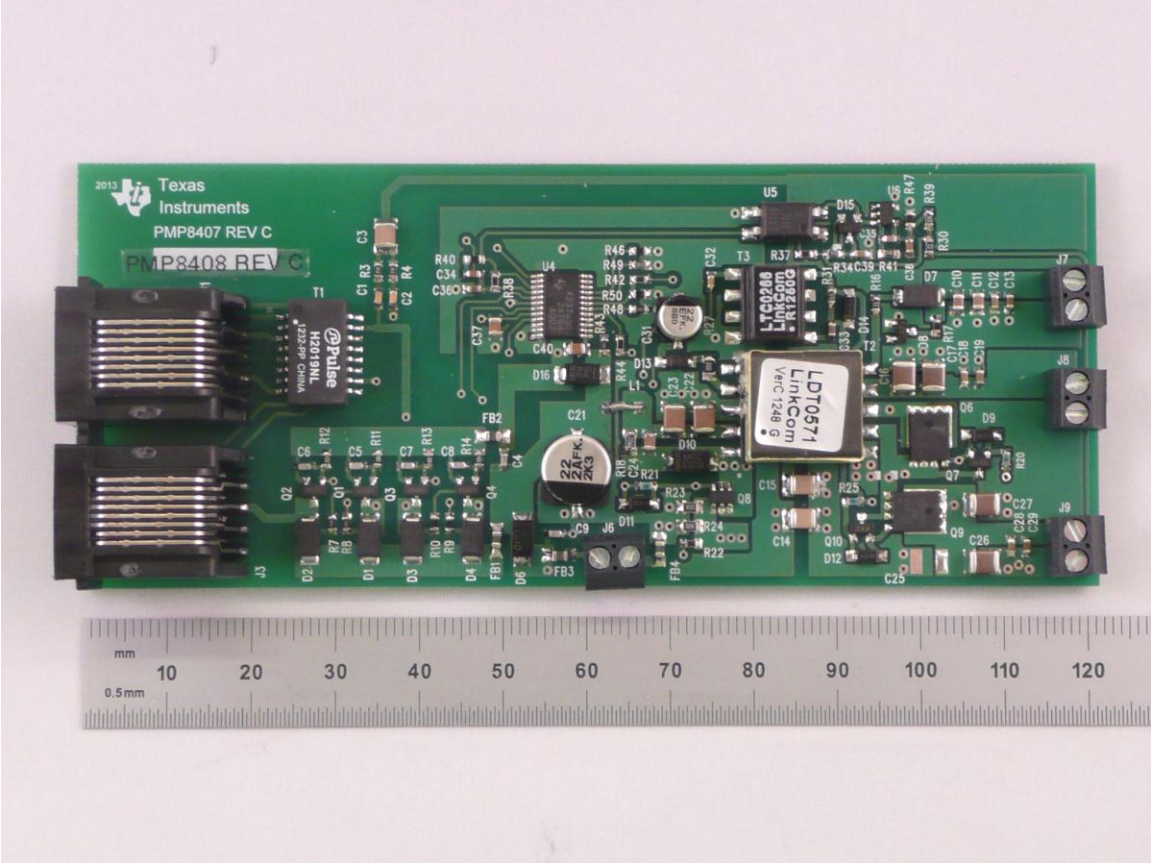


Photo:



Note: PMP8408 RevC is built on PMP8407 RevC PCB.

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