

**Test Data
For PMP9258
8/29/2013**



Circuit Description

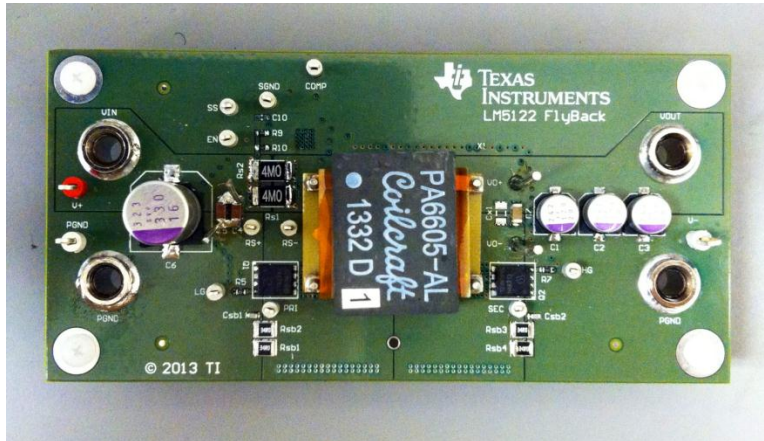
PMP9258 is a non-isolated synchronous flyback converter utilizing the LM5122 for industrial applications. The benefit of using a synchronous flyback over a SEPIC converter is size. The test report here is for 9V, 12V, & 16V in/12V out @ 5A of load current. Switching frequency is set to 230KHz. A custom flyback transformer from Coilcraft has is used in this design.

Vin	9VDCin to 16VDCin
Vout	12VDCout
Iout Max	5A
Fsw	230kHz

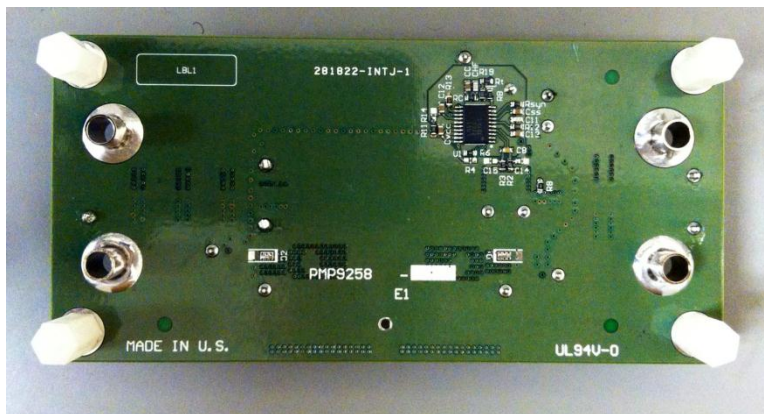
Fabrication

Top Side

Board Dimension 4.45" x 2.15"

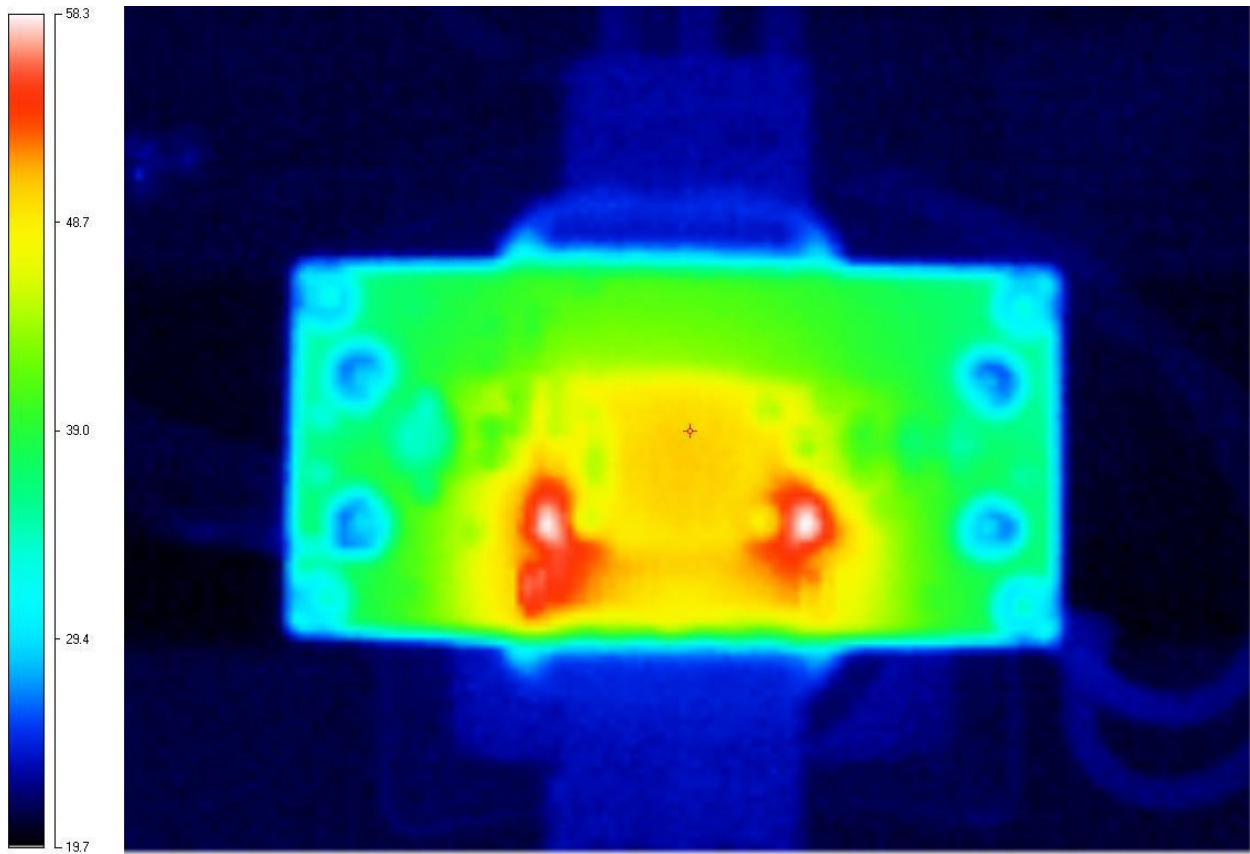


Bottom Side



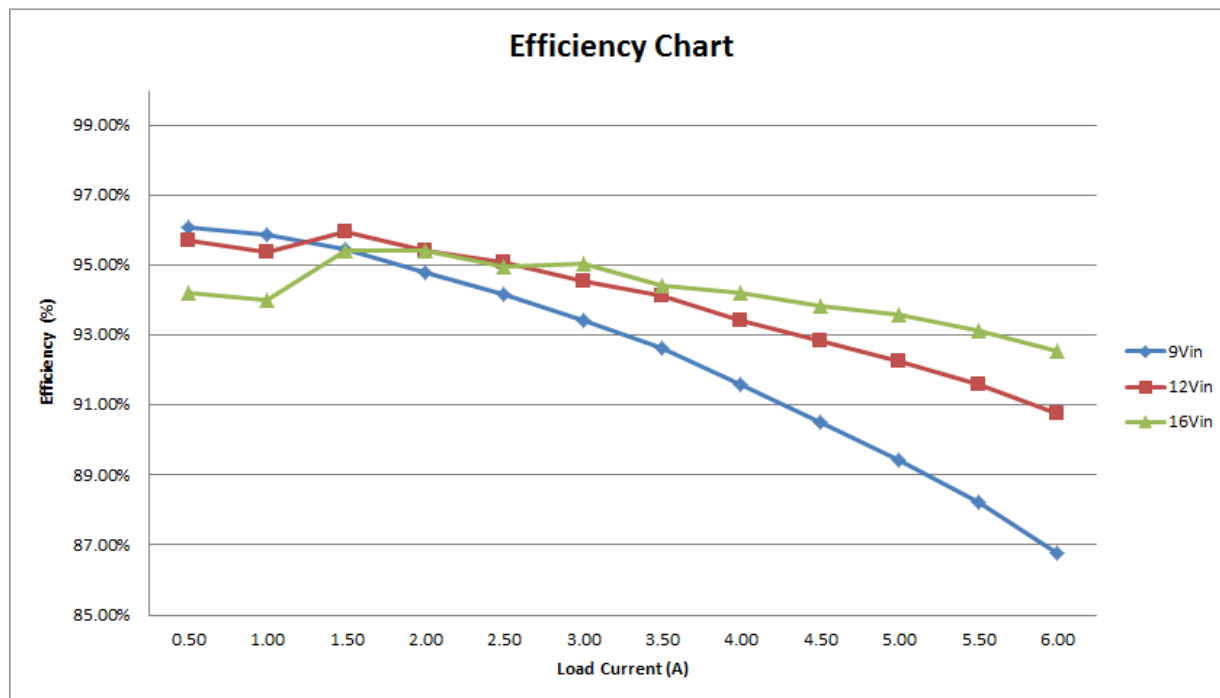
Thermal Image.

Steady State Temp at 12Vin, 12Vout, and 5A load.



MOSFETs and snubber resistors are the hottest items.

Efficiency Curve



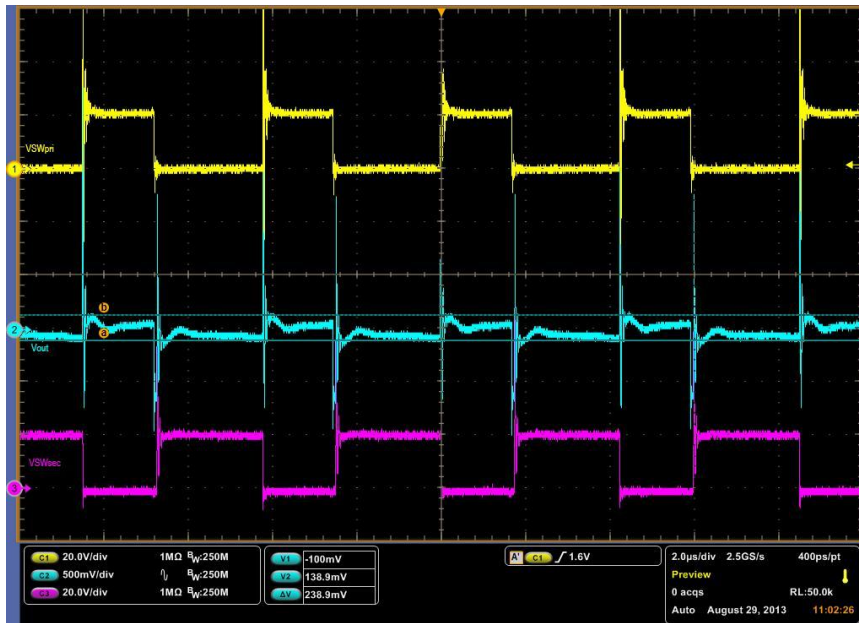
Efficiency Curve Data

(V _{IN})	(I _{IN})	(V _{OUT})	(I _{OUT})	(P _{IN})	(P _{OUT})	(P _{LOSS})	(Eff%)
9.00	0.02	11.9	0.01	0.17	0.119	0.05	69.59%
9.00	0.69	11.9	0.50	6.19	5.95	0.24	96.09%
9.00	1.38	11.9	1.00	12.41	11.9	0.51	95.88%
9.00	2.08	11.9	1.50	18.70	17.85	0.85	95.44%
9.00	2.79	11.9	2.00	25.11	23.8	1.31	94.78%
9.00	3.51	11.9	2.50	31.59	29.75	1.84	94.18%
9.00	4.25	11.91	3.00	38.25	35.73	2.52	93.41%
9.00	5.00	11.91	3.50	45.00	41.685	3.32	92.63%
9.00	5.78	11.91	4.00	52.02	47.64	4.38	91.58%
9.00	6.58	11.91	4.50	59.22	53.595	5.63	90.50%
9.00	7.40	11.91	5.00	66.60	59.55	7.05	89.41%
9.00	8.25	11.91	5.50	74.25	65.505	8.75	88.22%
9.00	9.16	11.92	6.00	82.44	71.52	10.92	86.75%
(V _{IN})	(I _{IN})	(V _{OUT})	(I _{OUT})	(P _{IN})	(P _{OUT})	(P _{LOSS})	(Eff%)
12.00	0.022	11.91	0.01	0.26	0.1191	0.14	45.11%
12.00	0.518	11.9	0.50	6.22	5.95	0.27	95.72%
12.00	1.04	11.9	1.00	12.48	11.9	0.58	95.35%
12.00	1.55	11.9	1.50	18.60	17.85	0.75	95.97%
12.00	2.08	11.91	2.00	24.96	23.82	1.14	95.43%
12.00	2.61	11.91	2.50	31.32	29.775	1.55	95.07%
12.00	3.15	11.91	3.00	37.80	35.73	2.07	94.52%
12.00	3.69	11.91	3.50	44.28	41.685	2.60	94.14%
12.00	4.25	11.91	4.00	51.00	47.64	3.36	93.41%
12.00	4.81	11.91	4.50	57.72	53.595	4.13	92.85%
12.00	5.38	11.91	5.00	64.56	59.55	5.01	92.24%
12.00	5.96	11.91	5.50	71.52	65.505	6.02	91.59%
12.00	6.56	11.91	6.00	78.72	71.46	7.26	90.78%
(V _{IN})	(I _{IN})	(V _{OUT})	(I _{OUT})	(P _{IN})	(P _{OUT})	(P _{LOSS})	(Eff%)
16.00	0.027	11.91	0.01	0.43	0.1191	0.31	27.57%
16.00	0.395	11.91	0.50	6.32	5.955	0.37	94.22%
16.00	0.792	11.91	1.00	12.67	11.91	0.76	93.99%
16.00	1.17	11.91	1.50	18.72	17.865	0.85	95.43%
16.00	1.56	11.91	2.00	24.96	23.82	1.14	95.43%
16.00	1.96	11.91	2.50	31.36	29.775	1.59	94.95%
16.00	2.35	11.91	3.00	37.60	35.73	1.87	95.03%
16.00	2.76	11.91	3.50	44.16	41.685	2.47	94.40%
16.00	3.16	11.91	4.00	50.56	47.64	2.92	94.22%
16.00	3.57	11.91	4.50	57.12	53.595	3.53	93.83%
16.00	3.98	11.92	5.00	63.68	59.6	4.08	93.59%
16.00	4.4	11.92	5.50	70.40	65.56	4.84	93.13%
16.00	4.83	11.92	6.00	77.28	71.52	5.76	92.55%

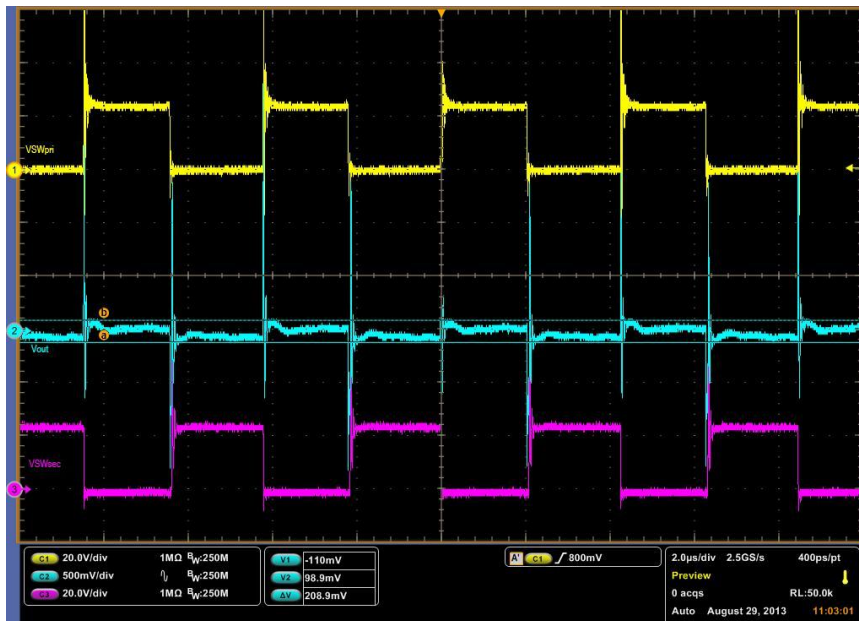
Waveforms

CH2 Vout

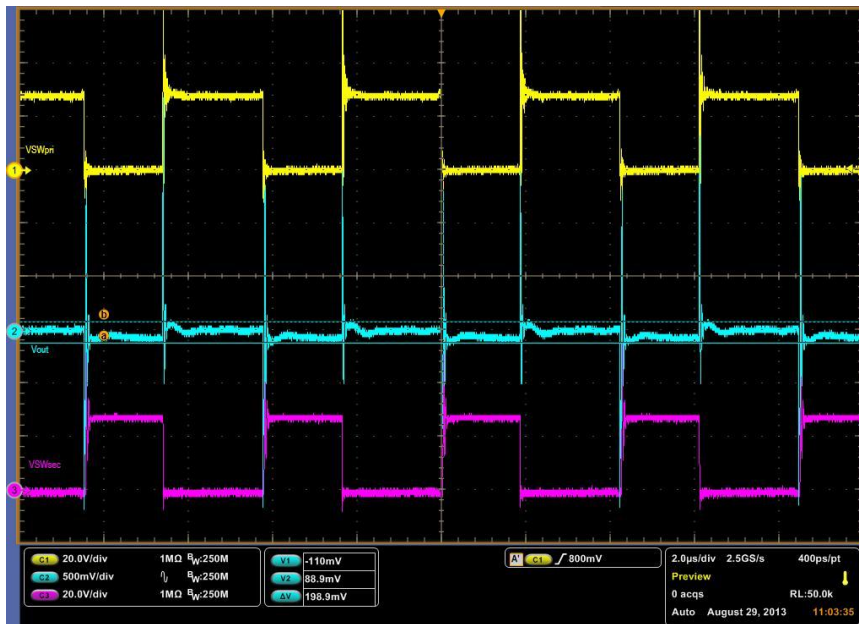
9Vin, 12V out @ 5A load current. (238.9mV p-p Ripple)



12Vin, 12V out @ 5A load current. (208.9mV p-p Ripple)

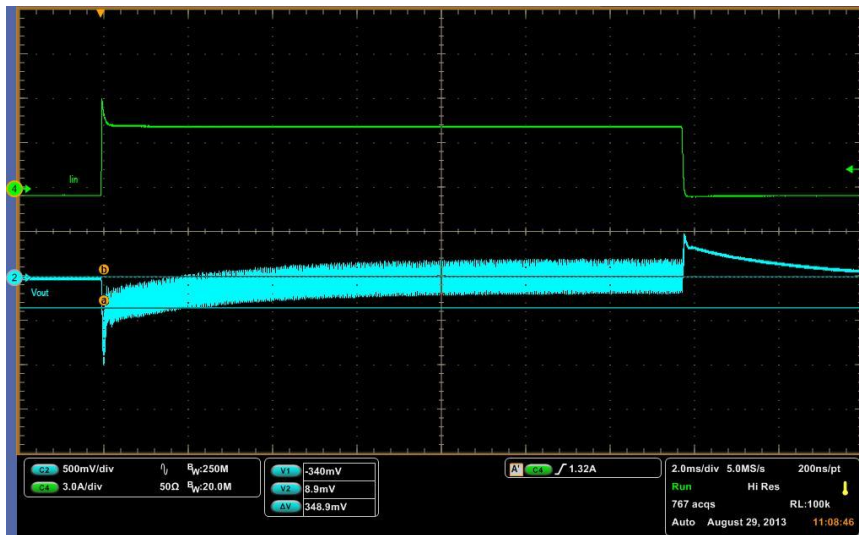


16Vin, 12V out @ 5A load current. (198.9mV p-p Ripple)

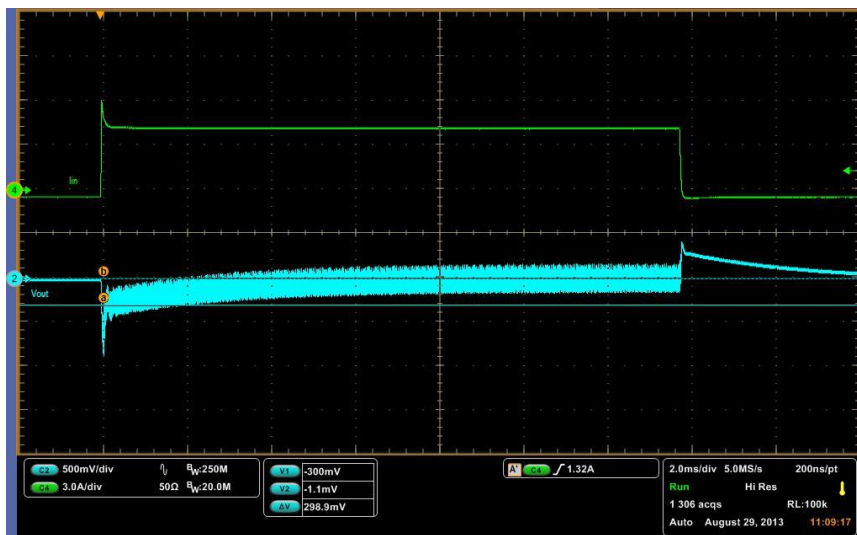


Transient Response Test

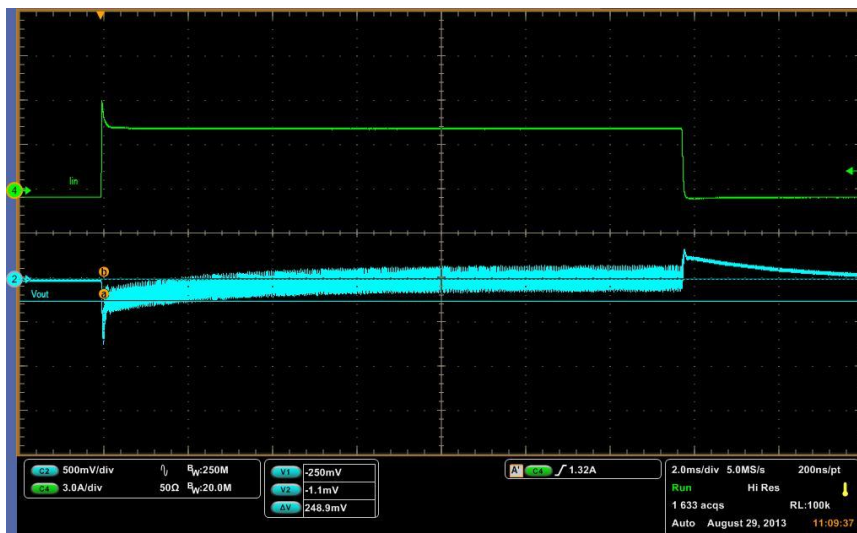
9V in @ 2.5A to 5A, 100mA/us Pulse frequency 30 Hz, 50% duty cycle, 12V out. Load Step on/off.



12V in @ 2.5A to 5A, 100mA/us Pulse frequency 30 Hz, 50% duty cycle, 12V out. Load Step on/off.

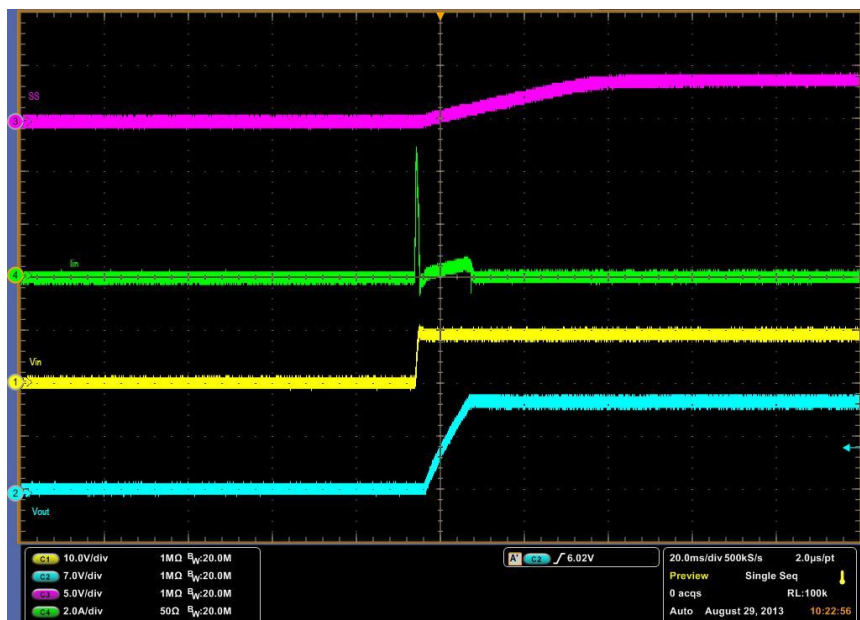


16V in @ 2.5A to 5A, 100mA/us Pulse frequency 30 Hz, 50% duty cycle, 12V out. Load Step on/off.

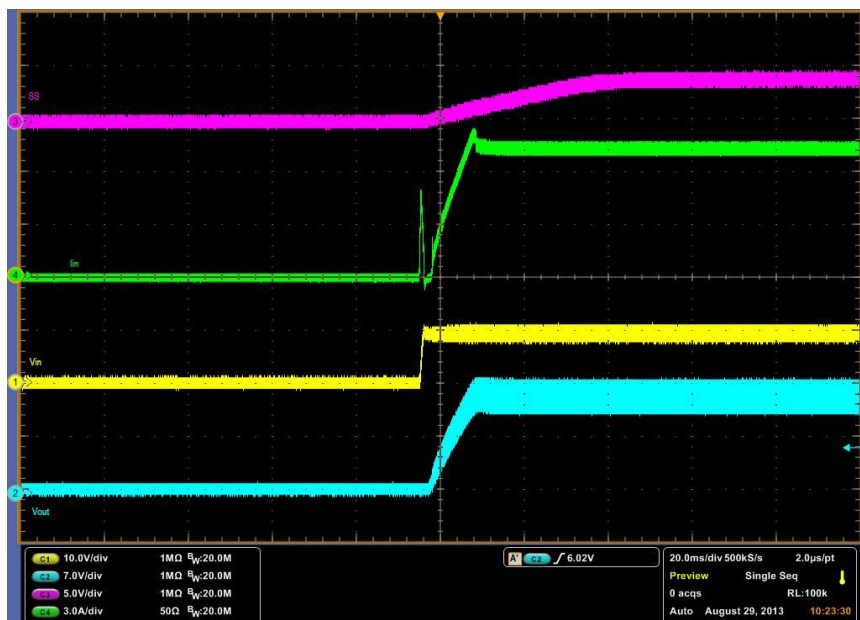


Startup Test

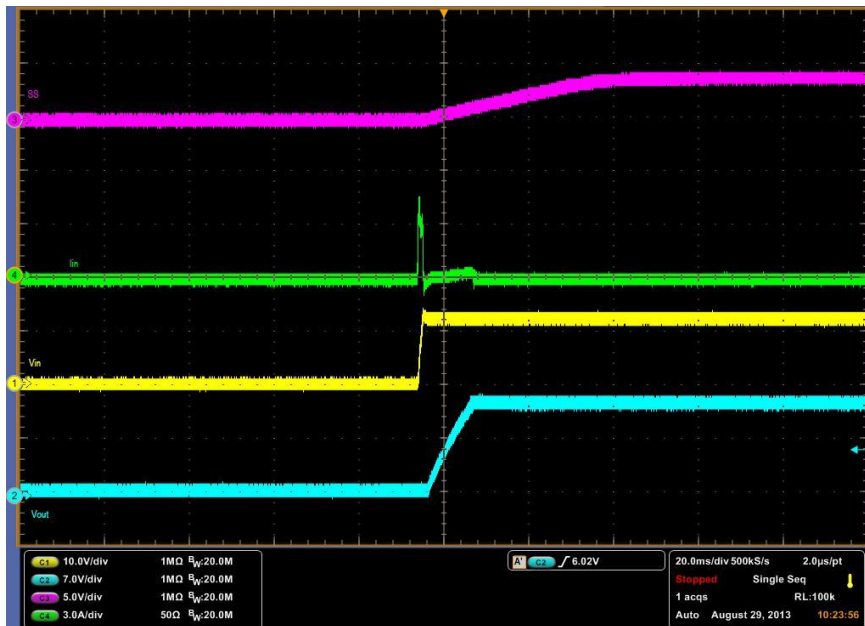
9Vin, 12V out @ no load current.



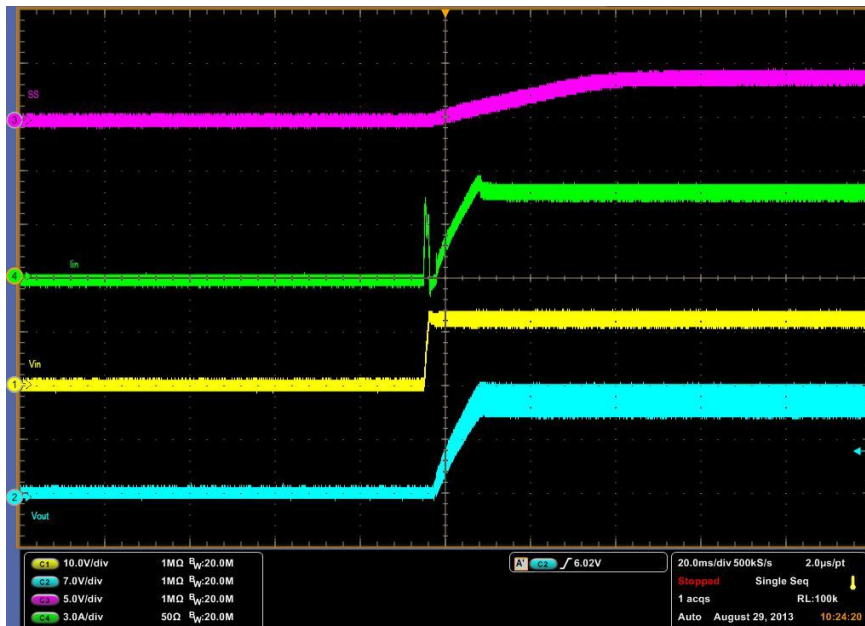
9Vin, 12V out @ 2.4ohm Load.



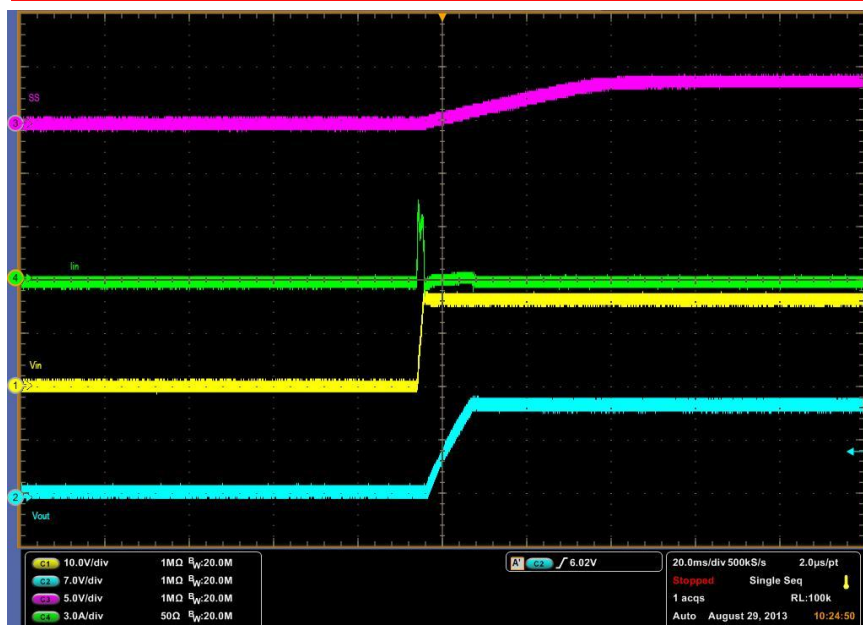
12Vin, 12V out @ no load current.



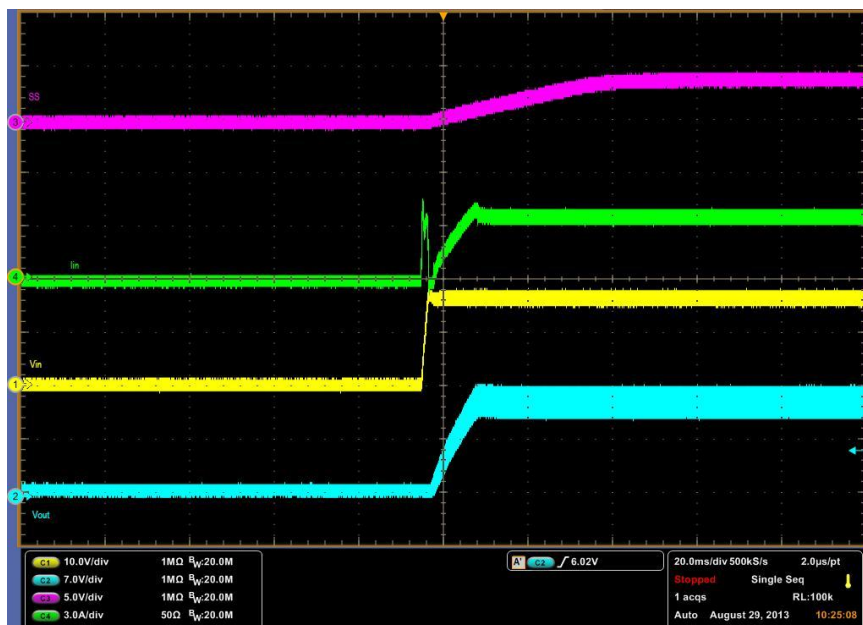
12Vin, 12V out @ 2.4ohm Load.



16Vin, 12V out @ no load current.



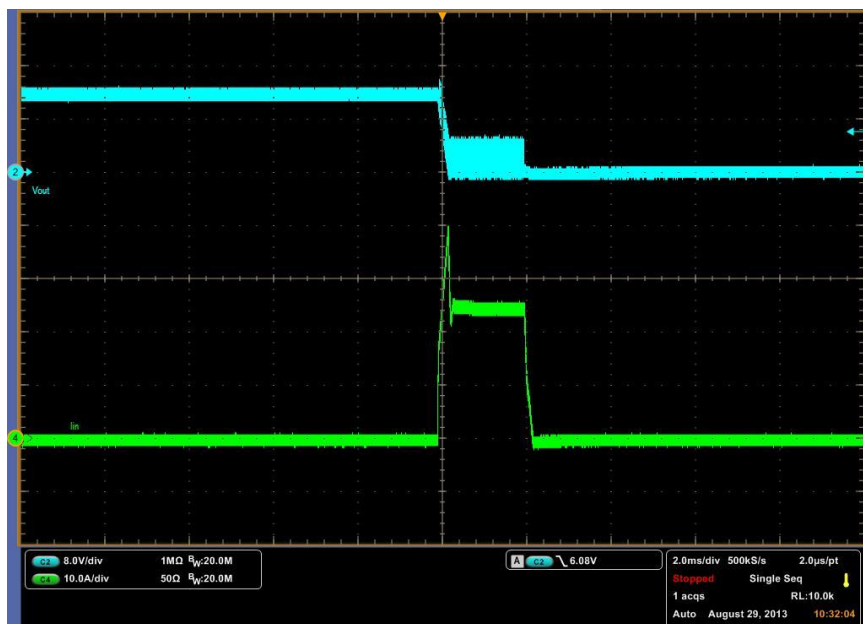
16Vin, 12V out @ 2.4ohm Load.



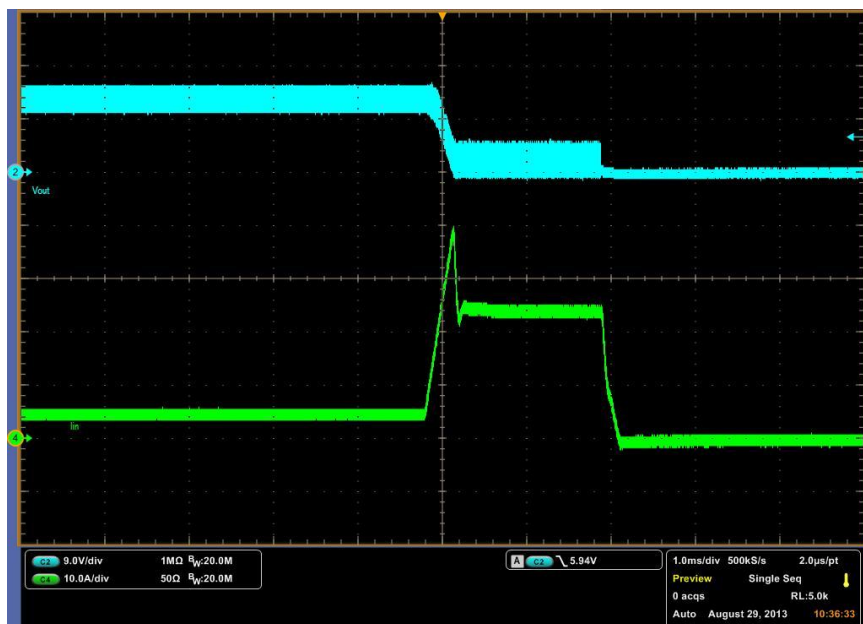
Short Circuit Test

Applied to board under the following conditions:

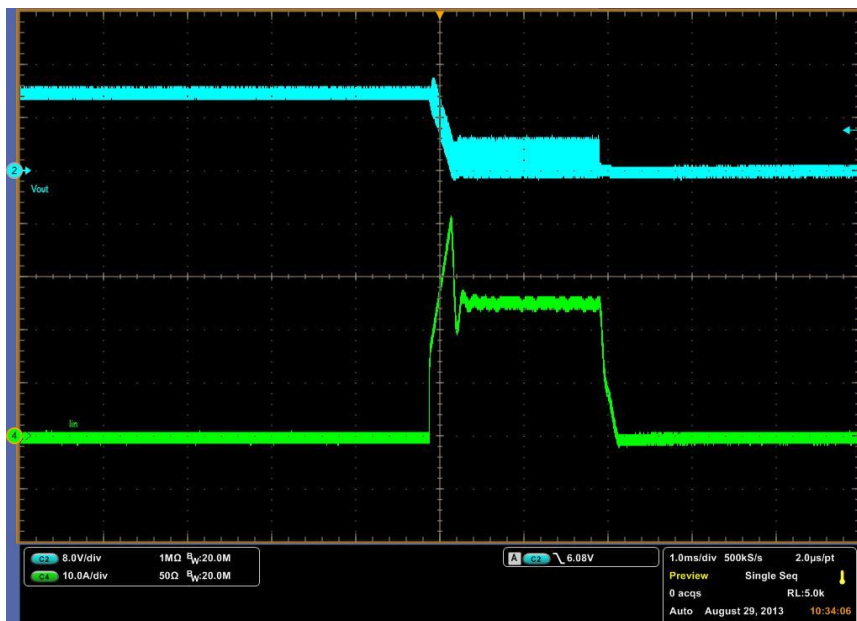
9Vin, 12V out @ 0A load current.



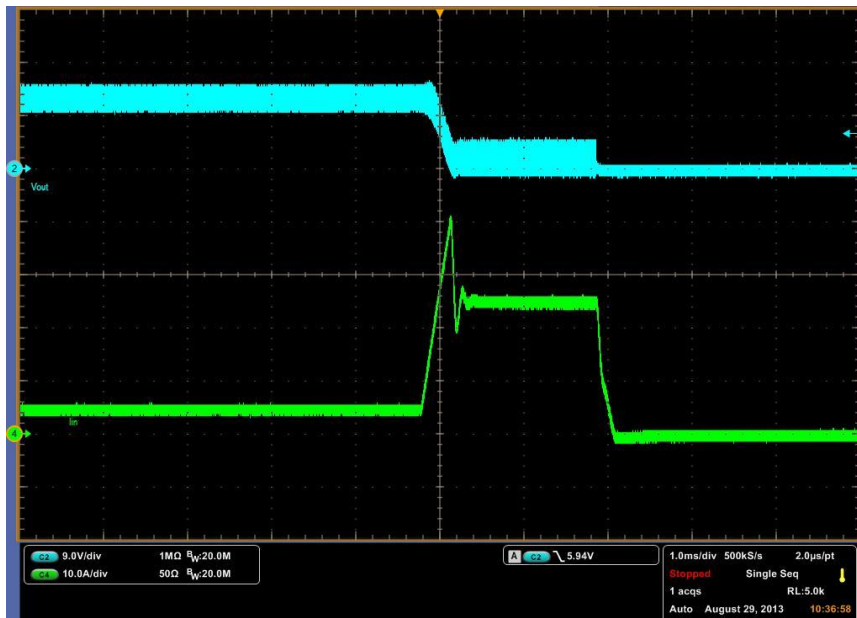
9Vin, 12V out @ 5A load current.



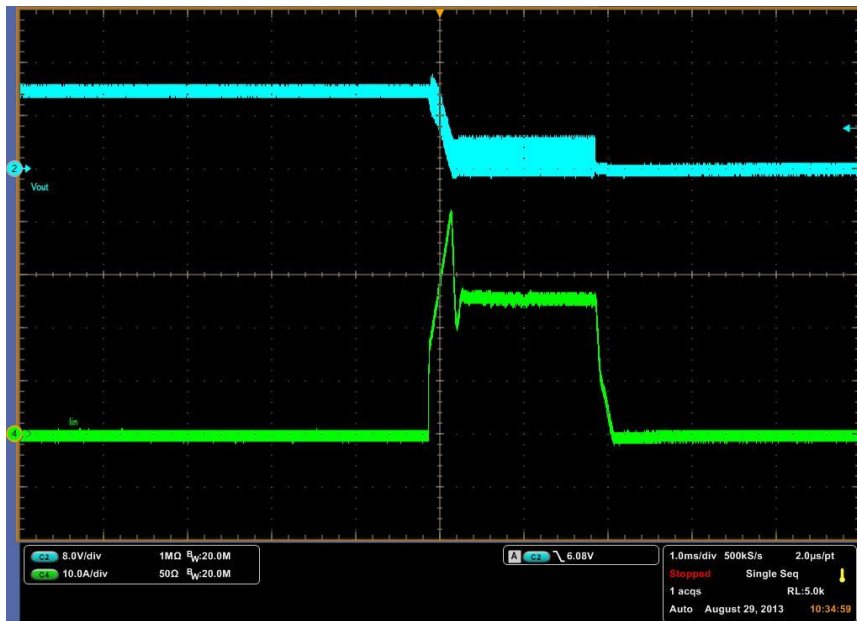
12Vin, 12V out @ 0A load current.



12Vin, 12V out @ 5A load current.



16Vin, 12V out @ 0A load current.



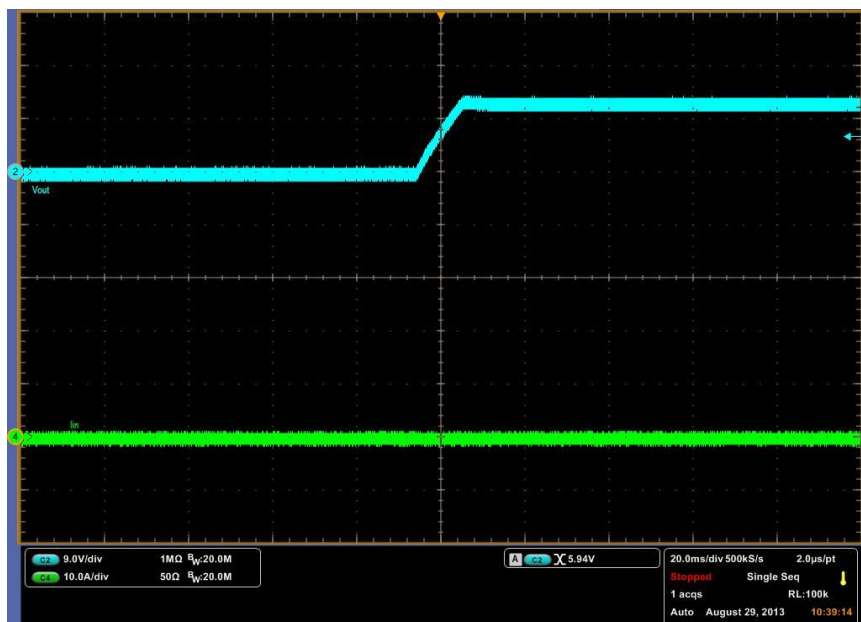
16Vin, 12V out @ 5A load current.



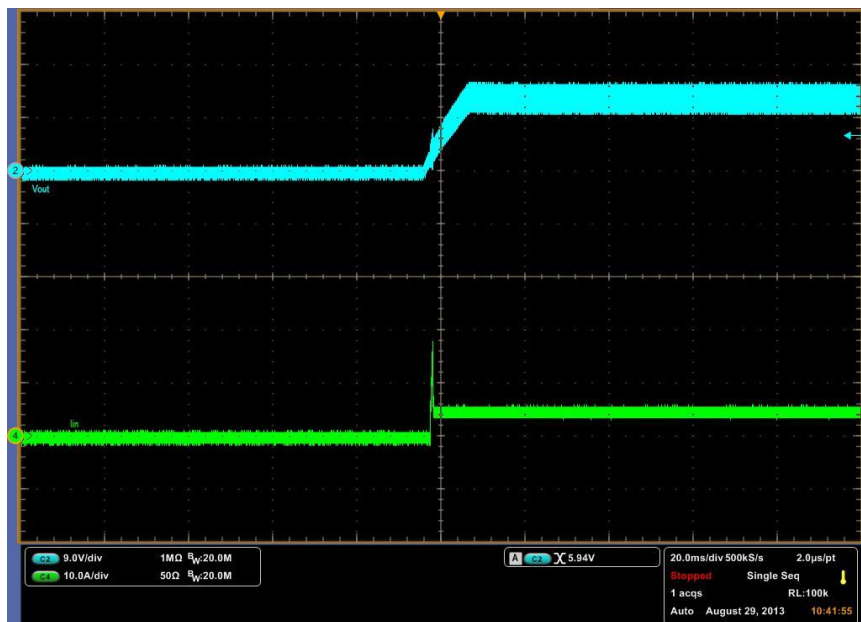
Short Circuit Recovery Test

Applied to board under the following conditions

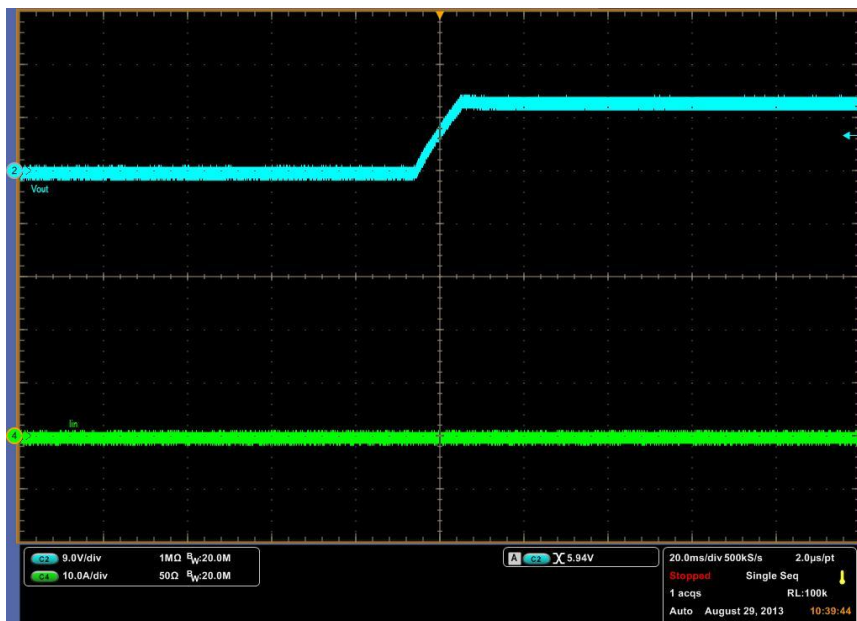
9Vin, 12V out @ 0A load current.



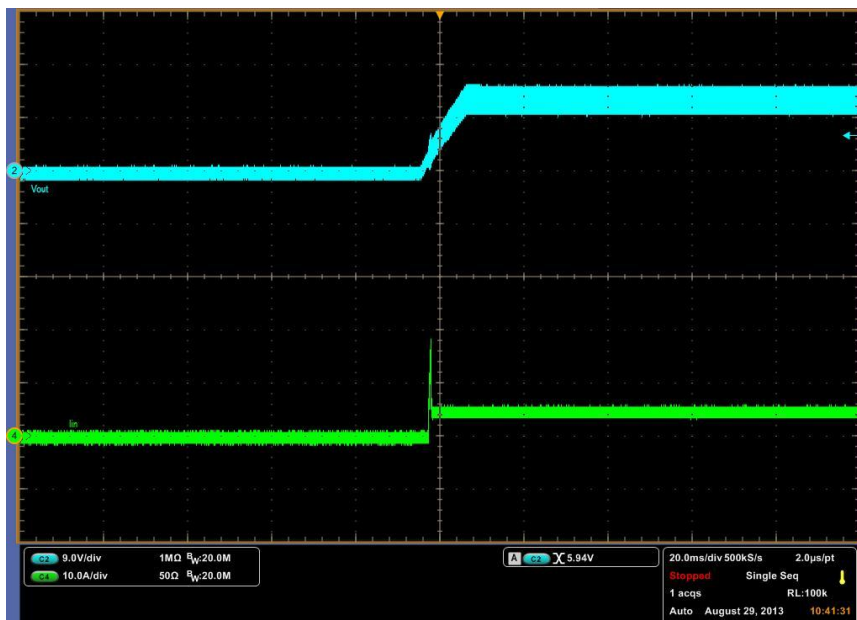
9Vin, 12V out @ 5A load current.



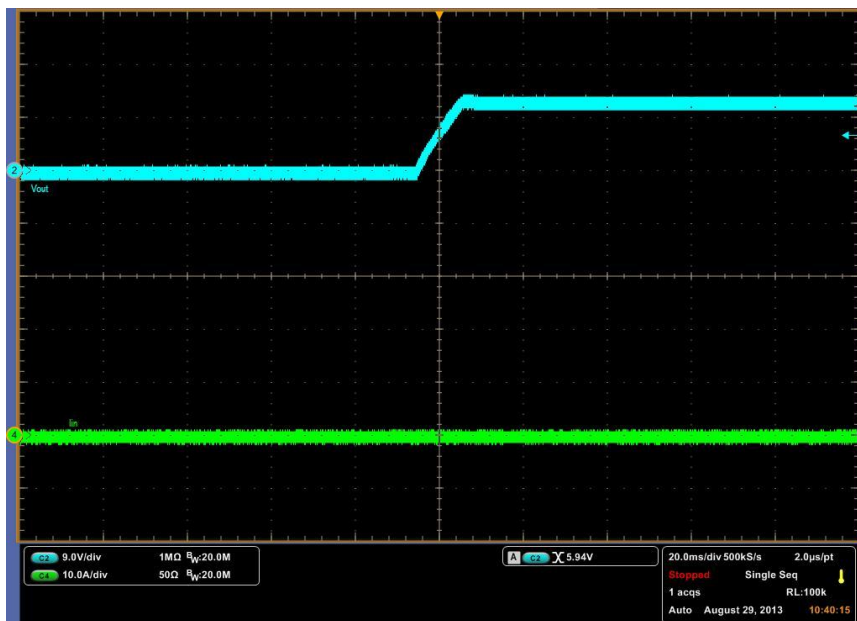
12Vin, 12V out @ 0A load current.



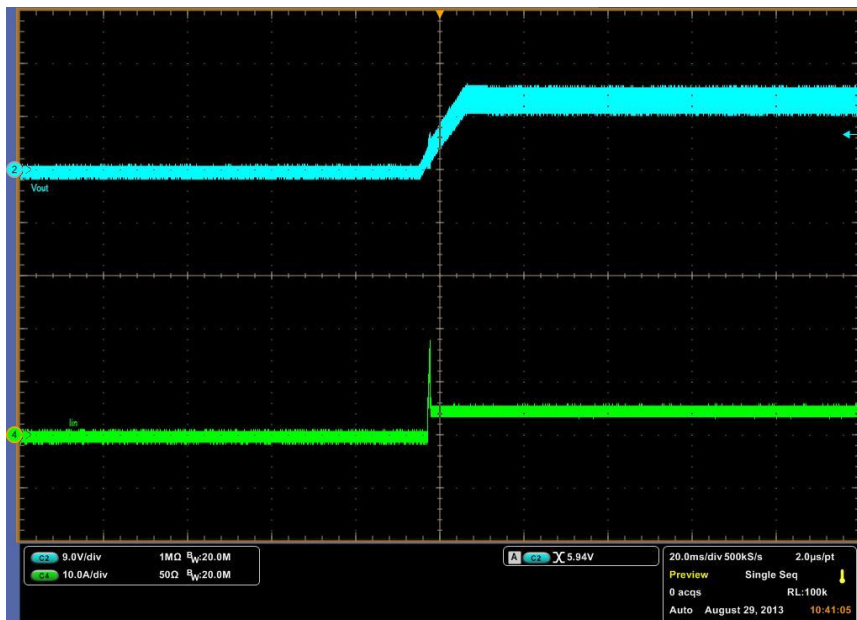
12Vin, 12V out @ 5A load current.



16Vin, 12V out @ 0A load current.



16Vin, 12V out @ 5A load current.



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