

**Test Data  
For PMP9298  
11/26/2013**



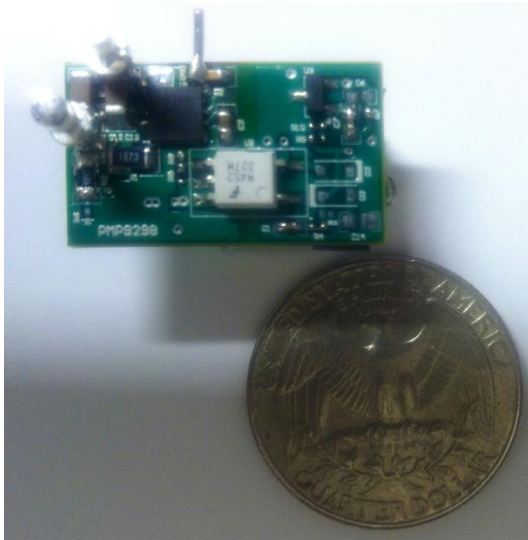
## 1. Circuit Description

PMP9298 is a Wide-Vin, synchronous buck regulator. This design uses an LM5017 COT synchronous buck regulator. The circuit has an operating input voltage range of 18V to 75V DC. The output is set to 15.0V at 200mA continuous. All tests were performed at room temperature on an open bench.

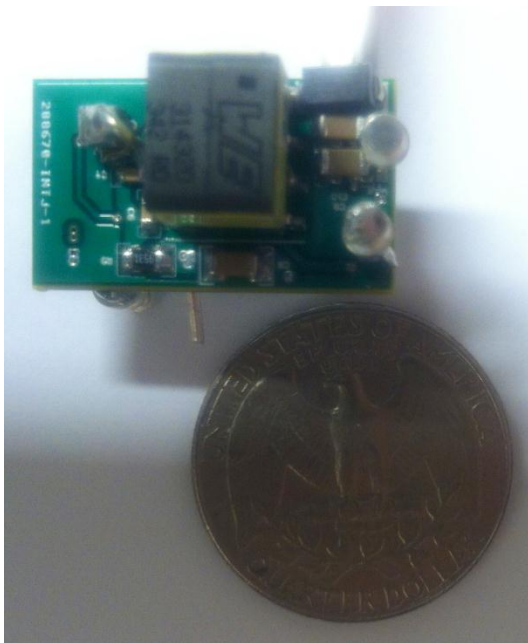
<b>Vin</b>	18V-75V
<b>Vout</b>	15V
<b>Iout Max</b>	0.2A
<b>Fsw</b>	≈ 450KHz

## 2. Photos

Top Side:



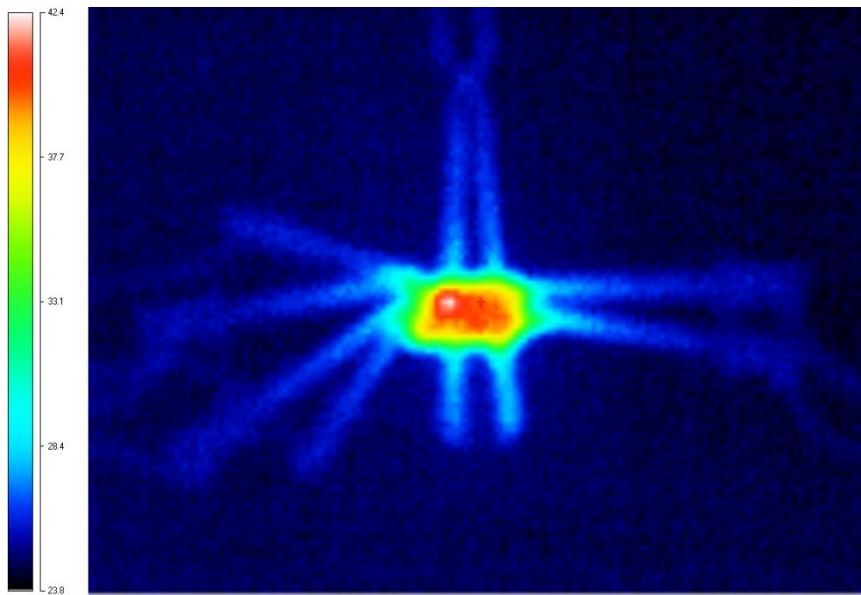
Bottom Side:



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### 3. Thermal Image.

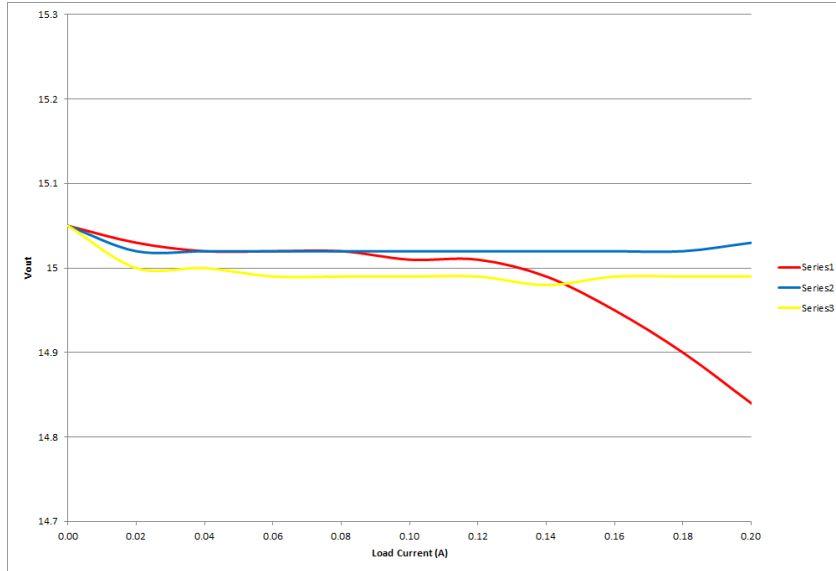
Steady State Temp at 24Vin, 15Vout at 0.2A.



The controller is the hottest item.

## 4. Efficiency Data

### Vout Function of Load Chart



### Efficiency Curve Data

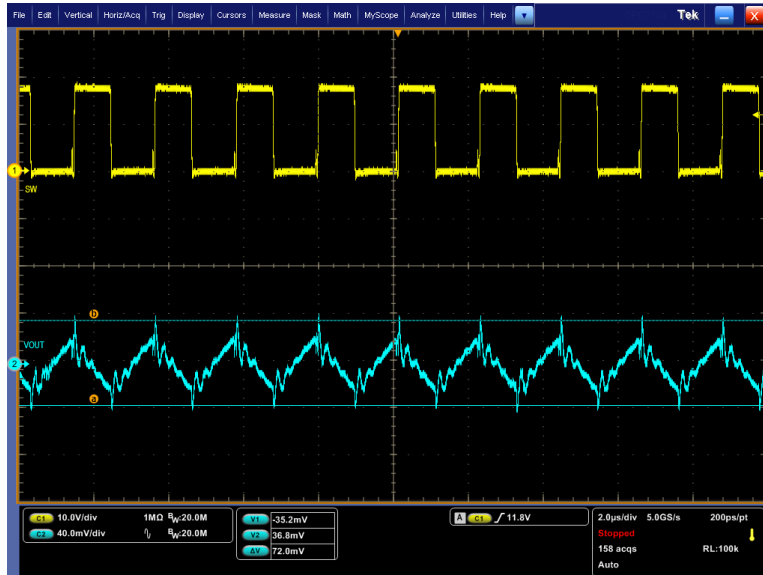
(V <sub>IN</sub> )	(I <sub>IN</sub> )	(V <sub>OUT</sub> )	(I <sub>OUT</sub> )	(P <sub>IN</sub> )	(P <sub>OUT</sub> )	(P <sub>LOSS</sub> )	(Eff%)
18.00	0.011	15.05	0.00	0.20	0.00	0.20	0.00%
18.00	0.030	15.03	0.02	0.54	0.30	0.24	55.67%
18.00	0.047	15.02	0.04	0.85	0.60	0.25	71.02%
18.00	0.067	15.02	0.06	1.21	0.90	0.30	74.73%
18.00	0.085	15.02	0.08	1.53	1.20	0.33	78.54%
18.00	0.104	15.01	0.10	1.87	1.50	0.37	80.18%
18.00	0.123	15.01	0.12	2.21	1.80	0.41	81.36%
18.00	0.141	14.99	0.14	2.54	2.10	0.44	82.69%
18.00	0.161	14.95	0.16	2.90	2.39	0.51	82.54%
18.00	0.177	14.90	0.18	3.19	2.68	0.50	84.18%
18.00	0.199	14.84	0.20	3.58	2.97	0.61	82.86%
(V <sub>IN</sub> )	(I <sub>IN</sub> )	(V <sub>OUT</sub> )	(I <sub>OUT</sub> )	(P <sub>IN</sub> )	(P <sub>OUT</sub> )	(P <sub>LOSS</sub> )	(Eff%)
24.00	0.011	15.05	0.00	0.26	0.00	0.26	0.00%
24.00	0.026	15.02	0.02	0.62	0.30	0.32	48.14%
24.00	0.038	15.02	0.04	0.91	0.60	0.31	65.88%
24.00	0.053	15.02	0.06	1.27	0.90	0.37	70.85%
24.00	0.067	15.02	0.08	1.61	1.20	0.41	74.73%
24.00	0.082	15.02	0.10	1.97	1.50	0.47	76.32%
24.00	0.096	15.02	0.12	2.30	1.80	0.50	78.23%
24.00	0.109	15.02	0.14	2.62	2.10	0.51	80.38%
24.00	0.124	15.02	0.16	2.98	2.40	0.57	80.75%
24.00	0.138	15.02	0.18	3.31	2.70	0.61	81.63%
24.00	0.153	15.03	0.20	3.67	3.01	0.67	81.86%
(V <sub>IN</sub> )	(I <sub>IN</sub> )	(V <sub>OUT</sub> )	(I <sub>OUT</sub> )	(P <sub>IN</sub> )	(P <sub>OUT</sub> )	(P <sub>LOSS</sub> )	(Eff%)
75.00	0.013	15.05	0.00	0.98	0.00	0.98	0.00%
75.00	0.019	15.00	0.02	1.43	0.30	1.13	21.05%
75.00	0.023	15.00	0.04	1.73	0.60	1.13	34.78%
75.00	0.028	14.99	0.06	2.10	0.90	1.20	42.83%
75.00	0.032	14.99	0.08	2.40	1.20	1.20	49.97%
75.00	0.038	14.99	0.10	2.85	1.50	1.35	52.60%
75.00	0.043	14.99	0.12	3.23	1.80	1.43	55.78%
75.00	0.049	14.98	0.14	3.68	2.10	1.58	57.07%
75.00	0.053	14.99	0.16	3.98	2.40	1.58	60.34%
75.00	0.059	14.99	0.18	4.43	2.70	1.73	60.98%
75.00	0.064	14.99	0.20	4.80	3.00	1.80	62.46%

## 5. Waveforms

### Switch-Node Voltage and Output Ripple Voltage

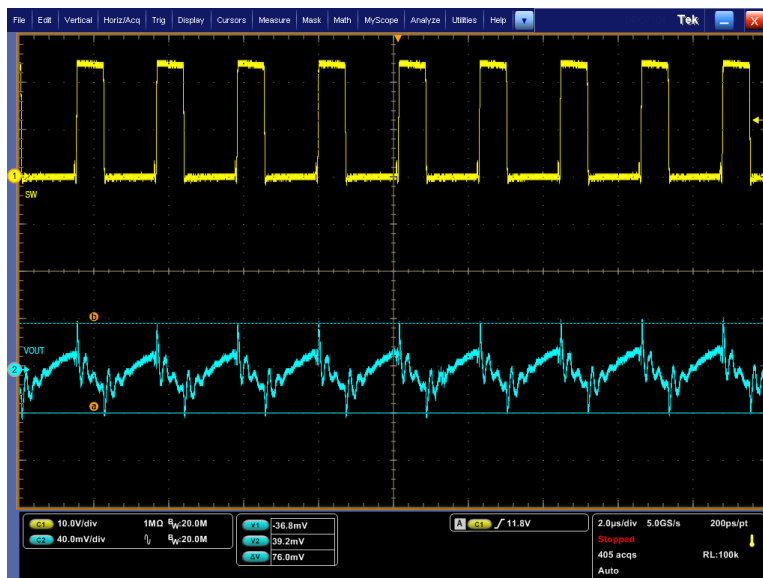
18.0Vin, 15.0Vout @ 200mA load current.

(~72.0mV p-p Ripple)

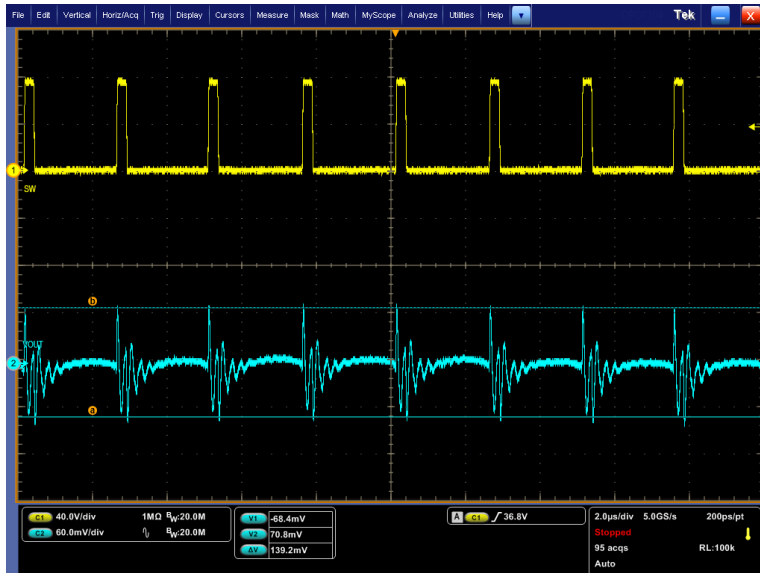


24.0Vin, 15.0Vout @ 200mA load current.

(~76.0mV p-p Ripple)

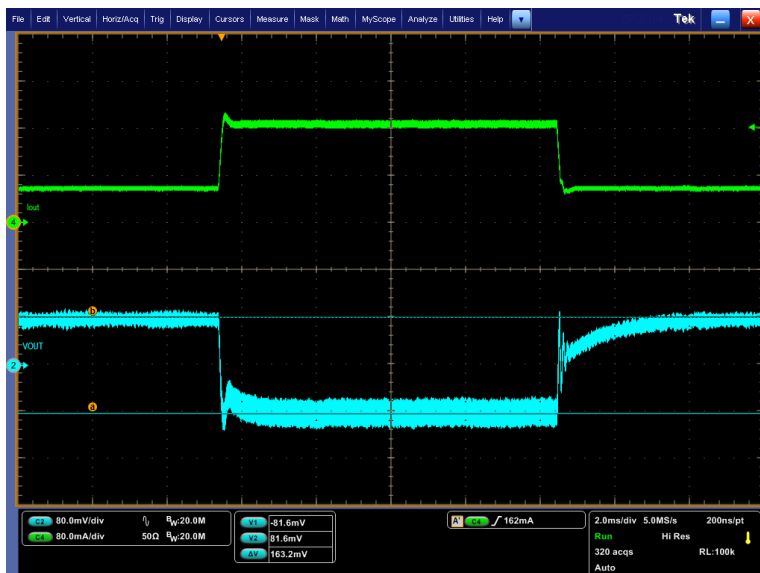


75.0Vin, 15.0Vout @ 200mA load current.  
(~139.2mV p-p Ripple)

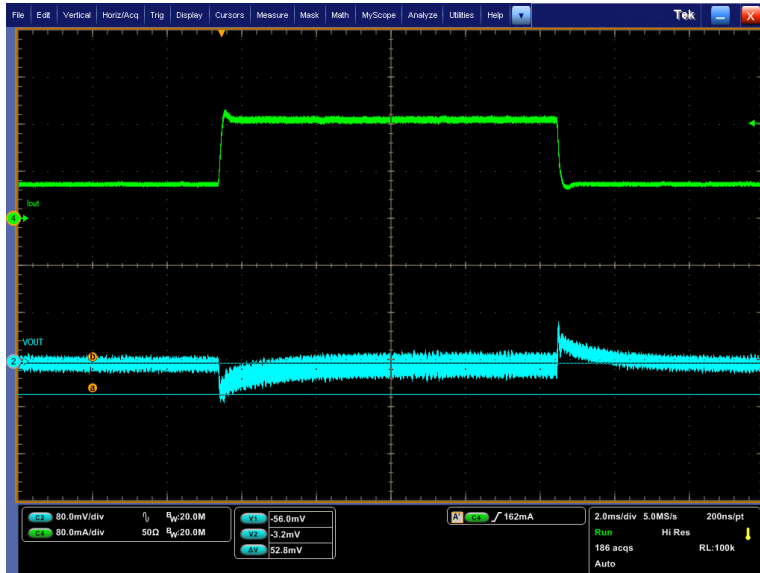


## Transient Response Test

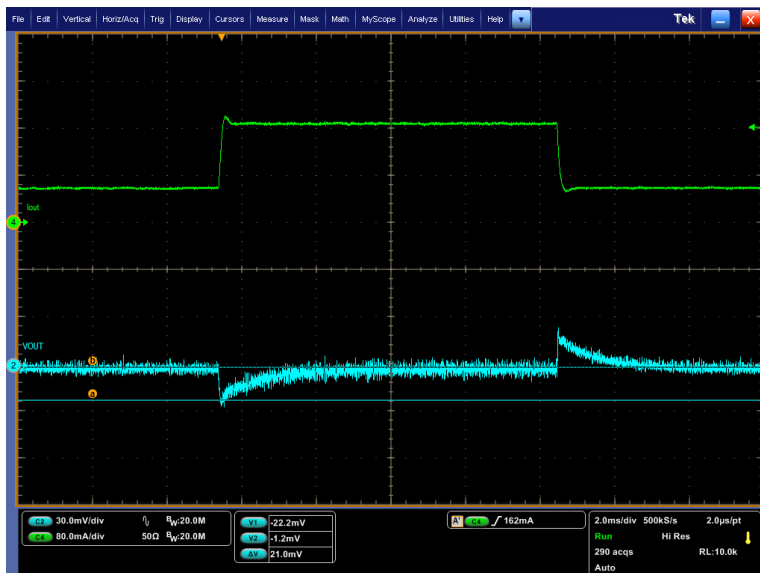
18.0Vin @ 100mA to 200mA, 100mA/µs, Pulse f @ 55 Hz,  
50% duty cycle, 15.0V out. Load Step on/off.



24.0Vin @ 100mA to 200mA, 100mA/ $\mu$ s, Pulse f @ 55 Hz,  
50% duty cycle, 15.0V out. Load Step on/off.



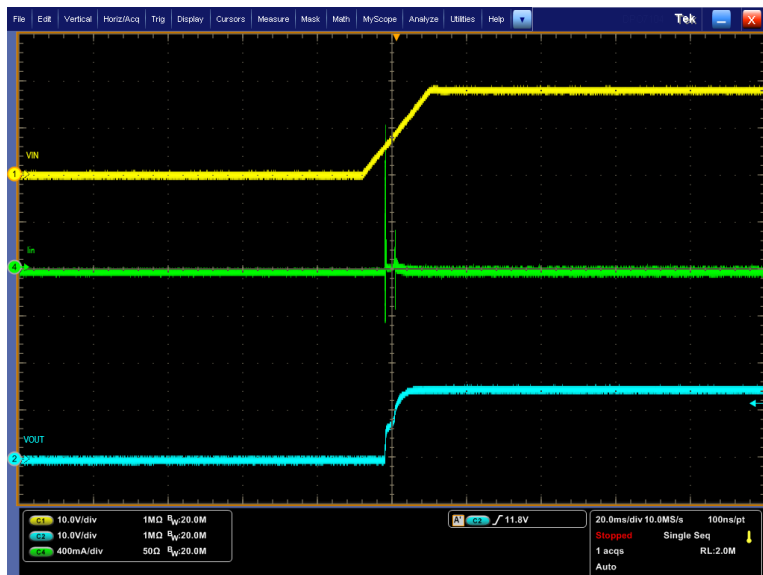
75.0Vin @ 100mA to 200mA, 100mA/ $\mu$ s, Pulse f @ 55 Hz,  
50% duty cycle, 15.0V out. Load Step on/off.



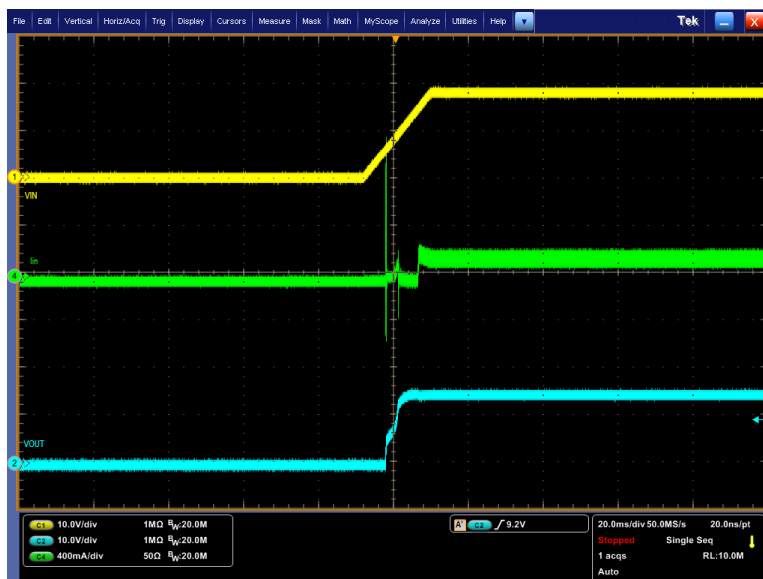


## Startup Test

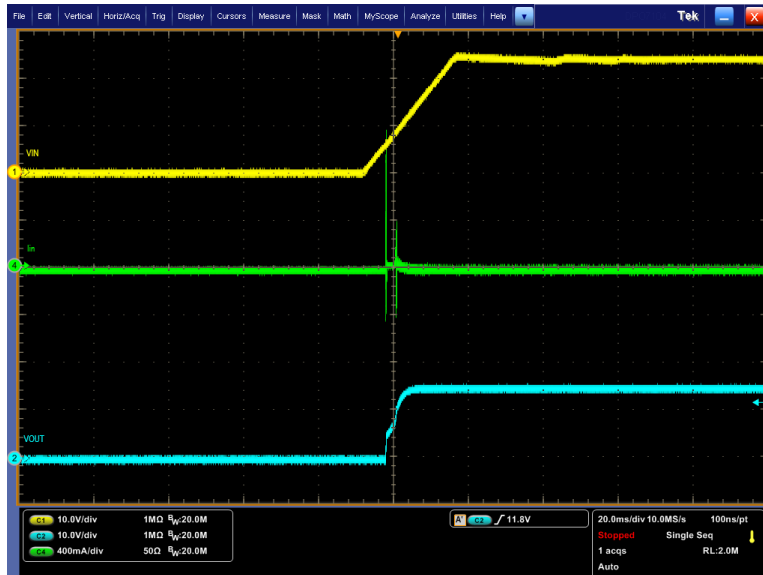
18Vin, 15Vout @ no load current.



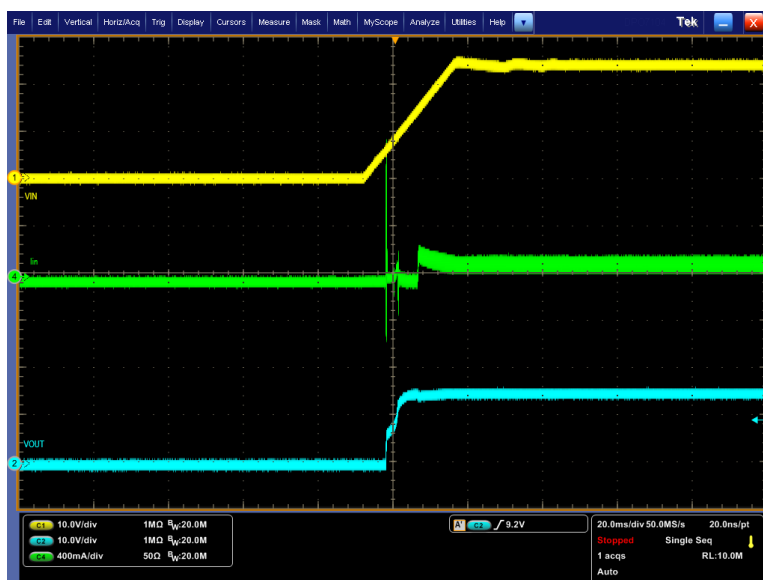
18Vin, 15Vout @ 90ohm Load.



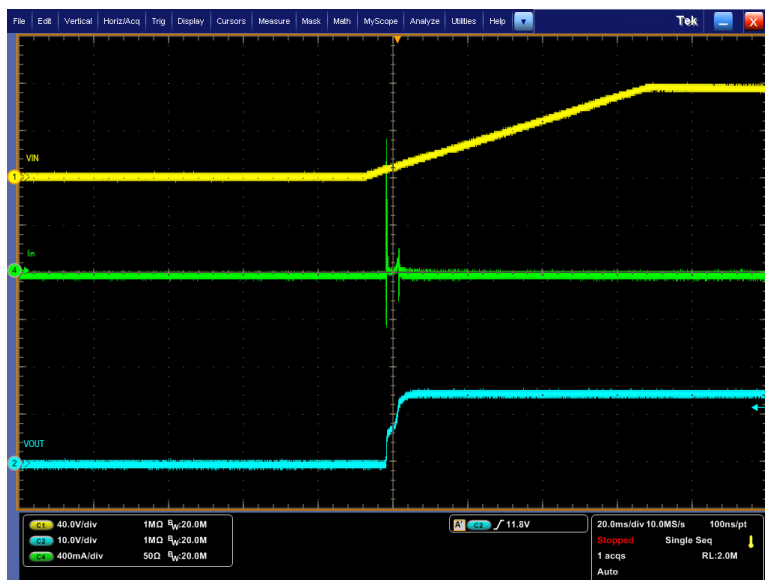
24Vin, 15Vout @ no load current.



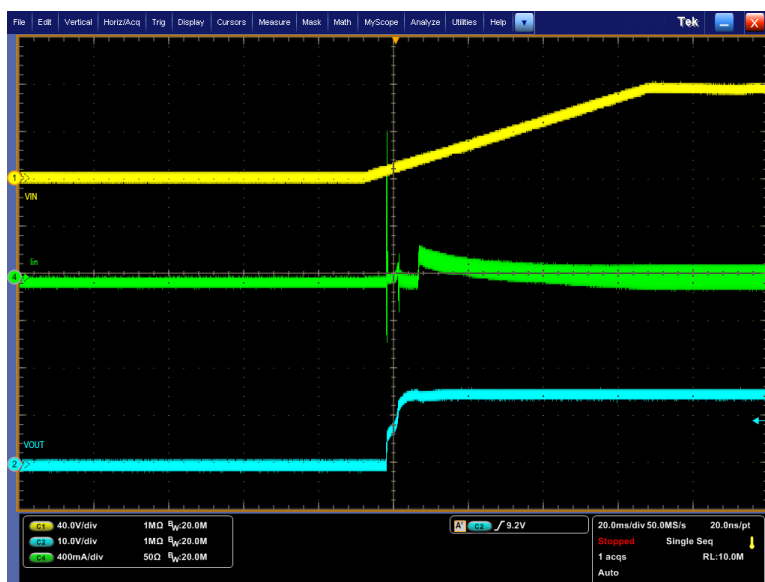
24Vin, 15Vout @ 120ohm Load.



75Vin, 15Vout @ no load current.



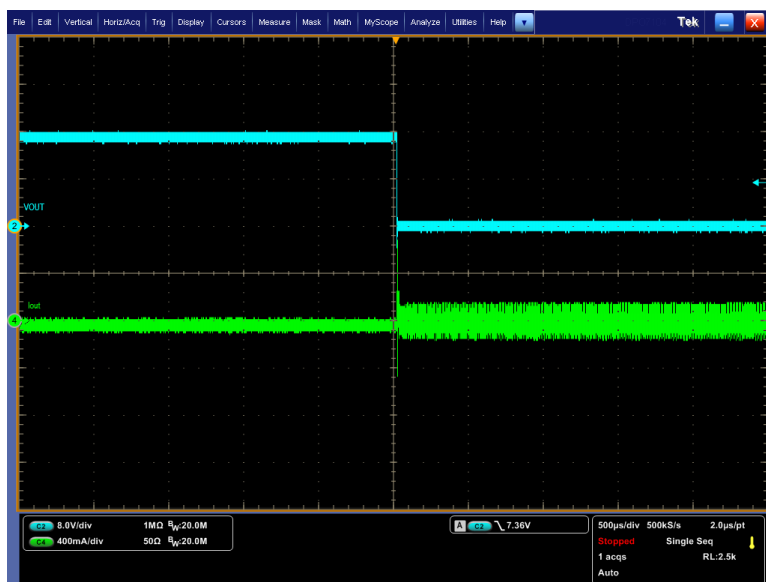
75Vin, 15Vout @ 375ohm Load.



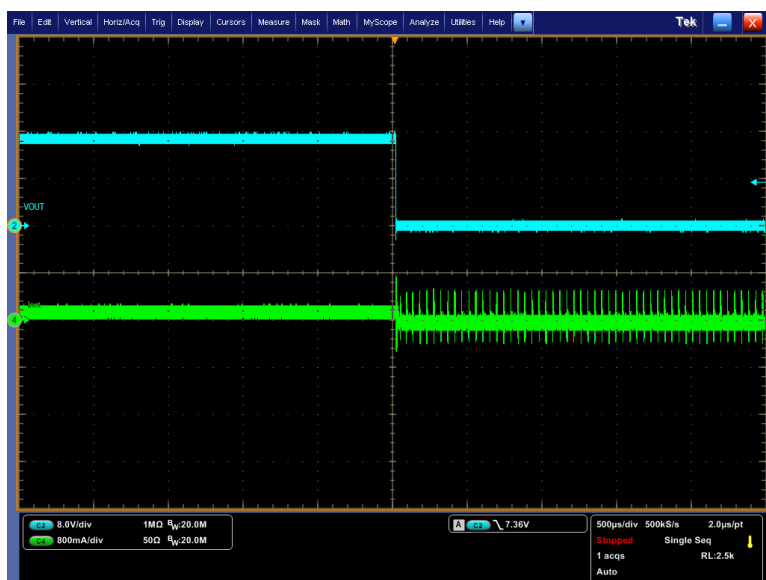
## Short-Circuit Test

Applied to board under the following conditions:

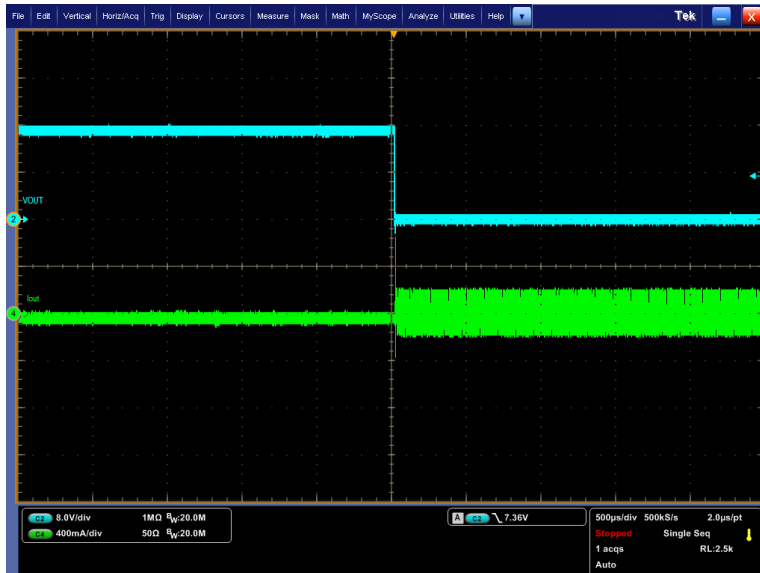
18Vin, 15Vout @ no load current.



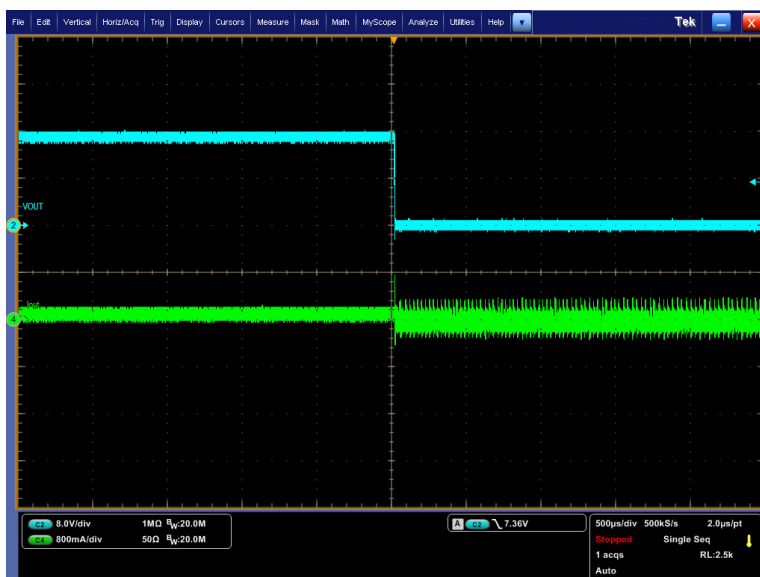
18Vin, 15Vout @ 200mA Load.



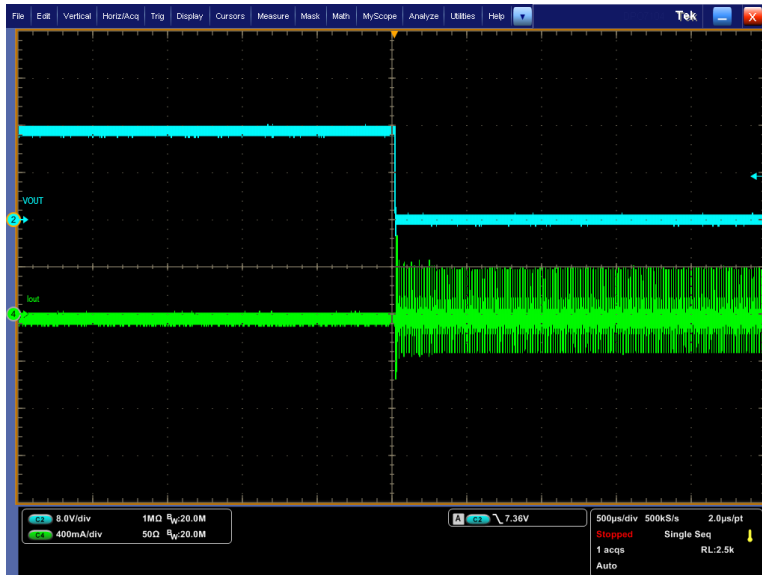
24Vin, 15V out @ no load current.



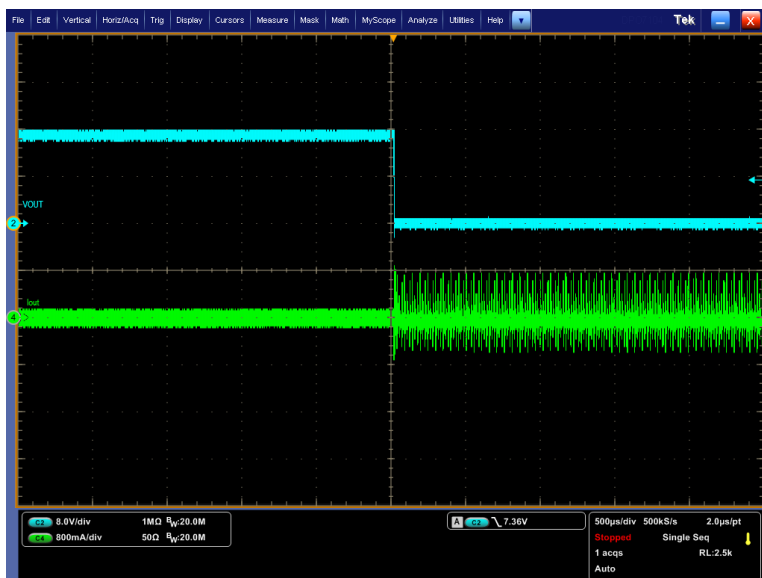
24Vin, 15Vout @ 200mA Load.



75Vin, 15Vout @ no load current.

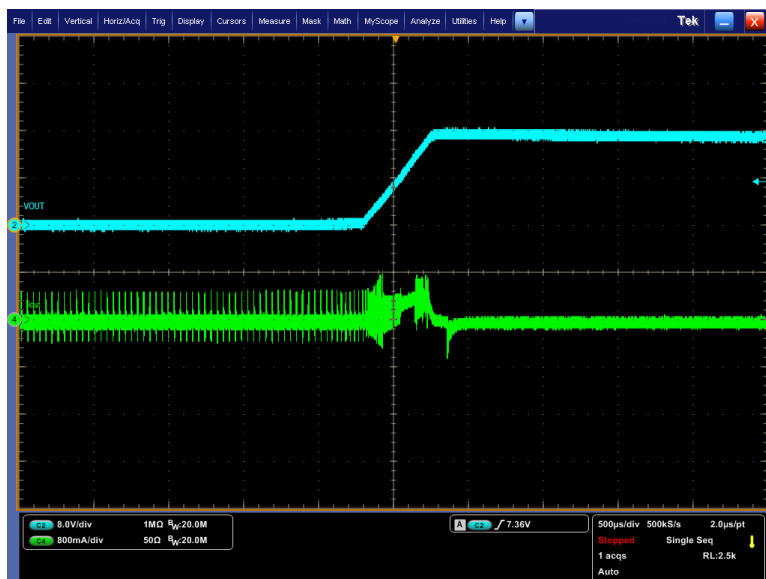


75Vin, 15Vout @ 200mA Load.

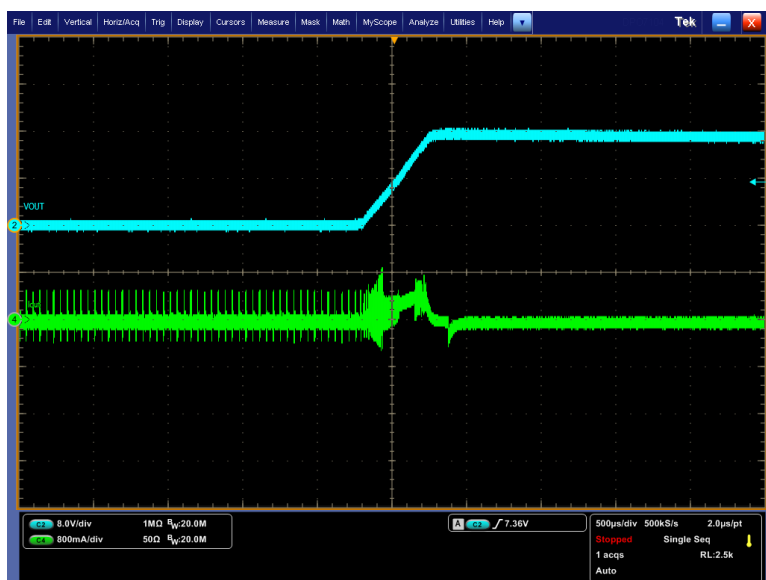


## Short-Circuit Recovery Test

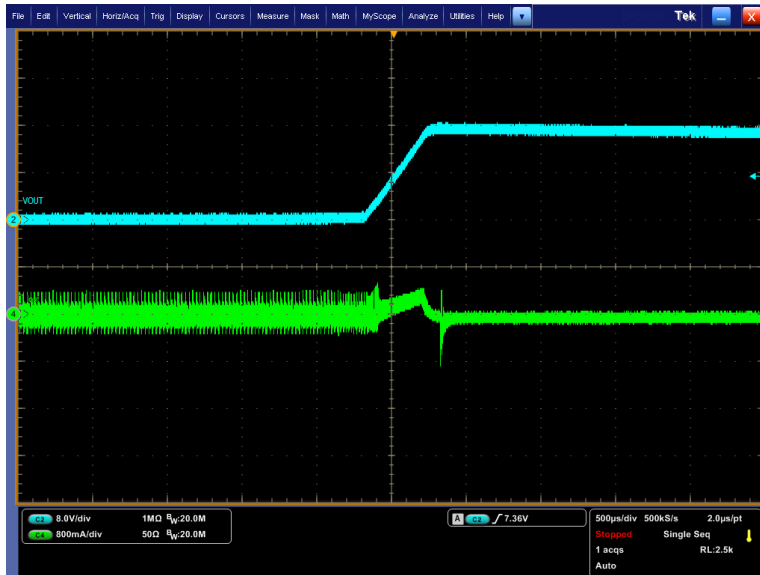
18Vin, 15Vout @ no load current.



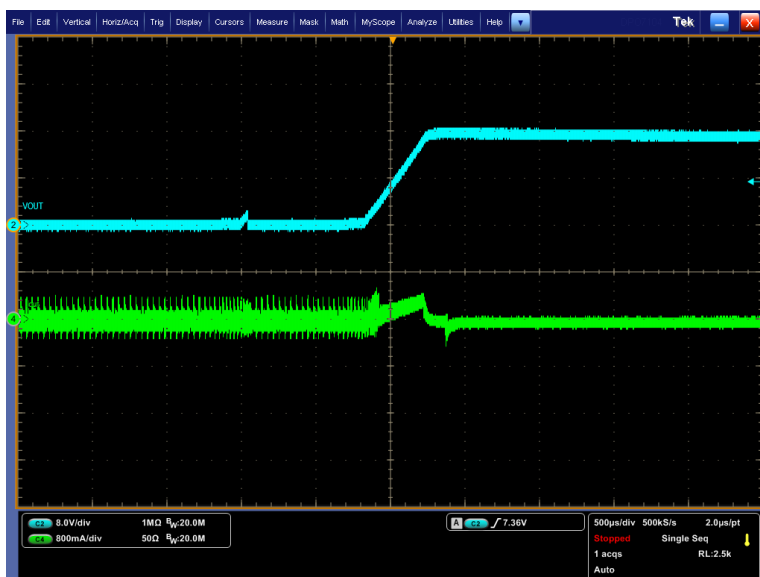
18Vin, 15V out @ 200mA Load.



24Vin, 15Vout @ no load current.

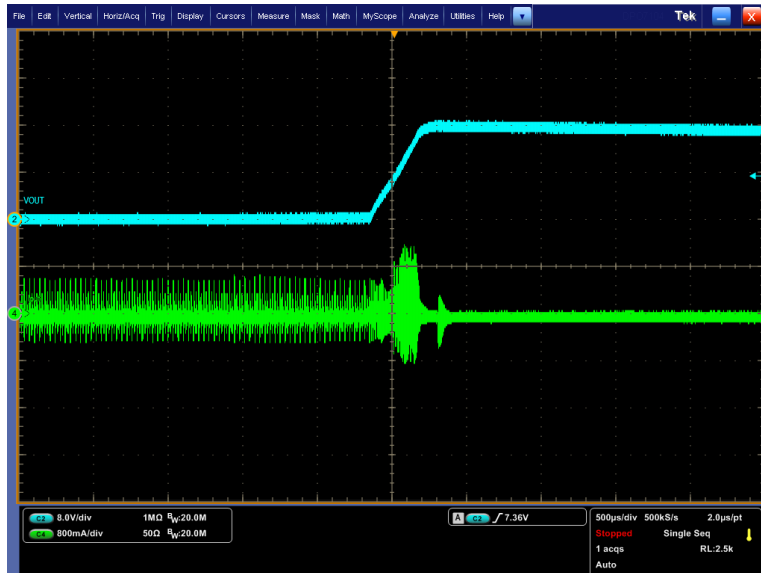


24Vin, 15Vout @ 200mA Load.

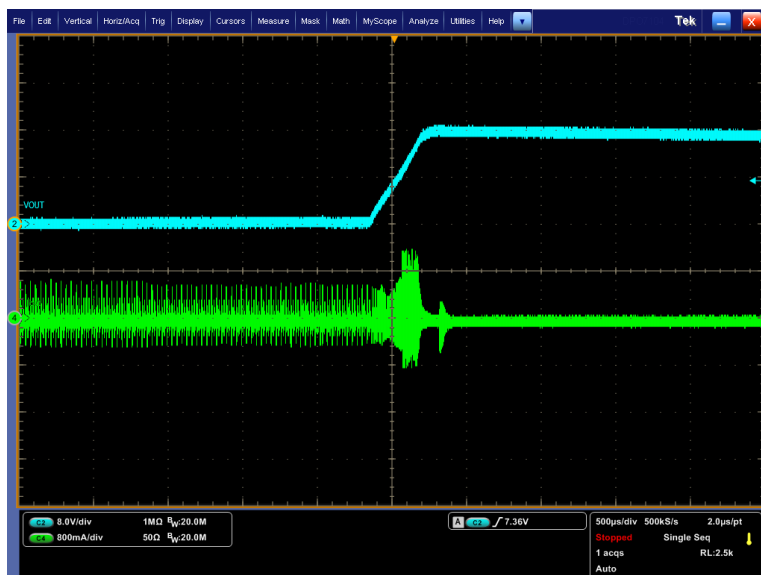




75Vin, 15V out @ no load current.



75Vin, 15Vout @ 200mA Load.



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