

**Test Data
For PMP9354
2/6/2014**



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1. Design Specifications

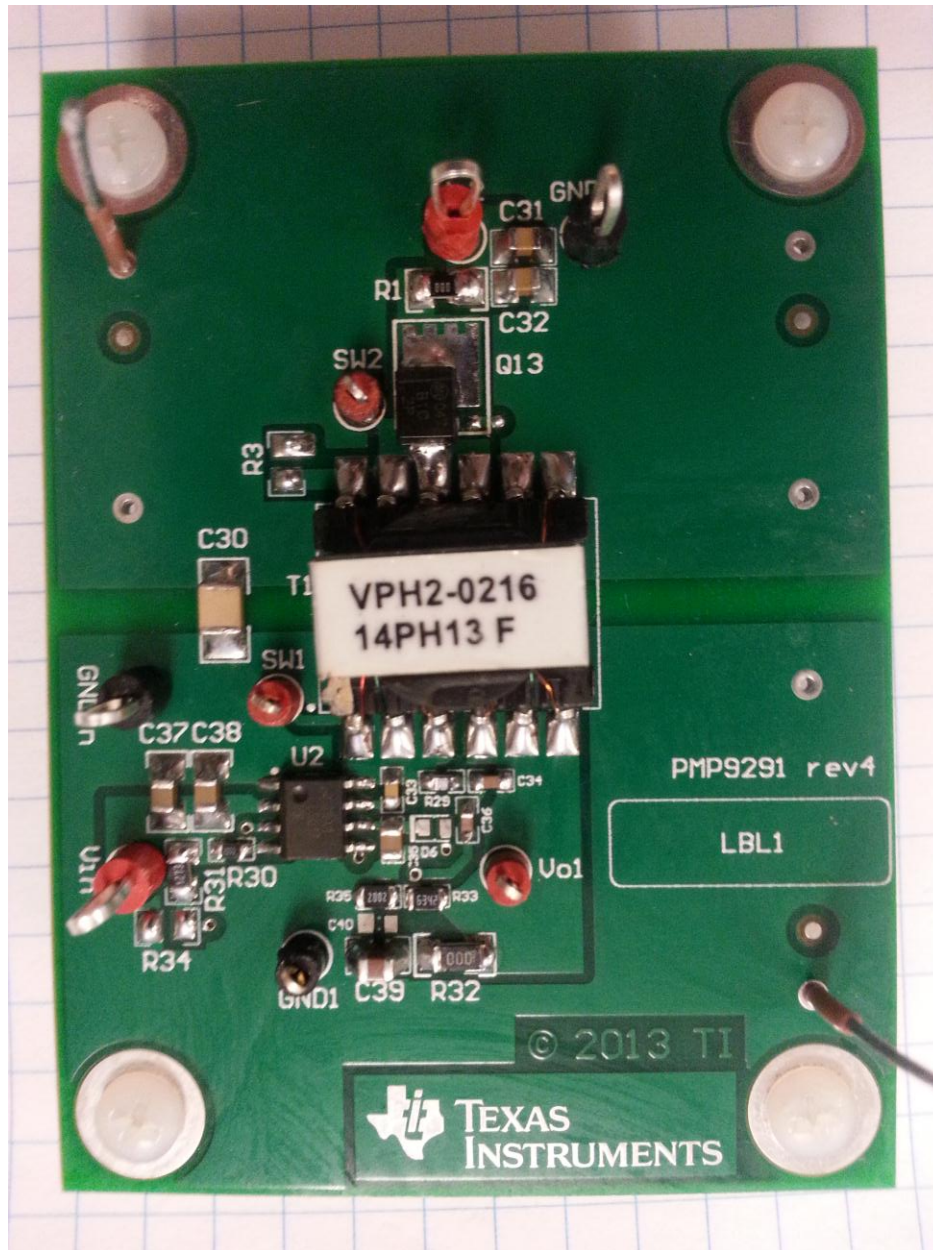
Vin	10.8VDC to 13.2VDC (12VDC Nominal)
Vout	5VDC
Iout	0.3A Max.
Approximate Switching Frequency	≈280KHz

2. Circuit Description

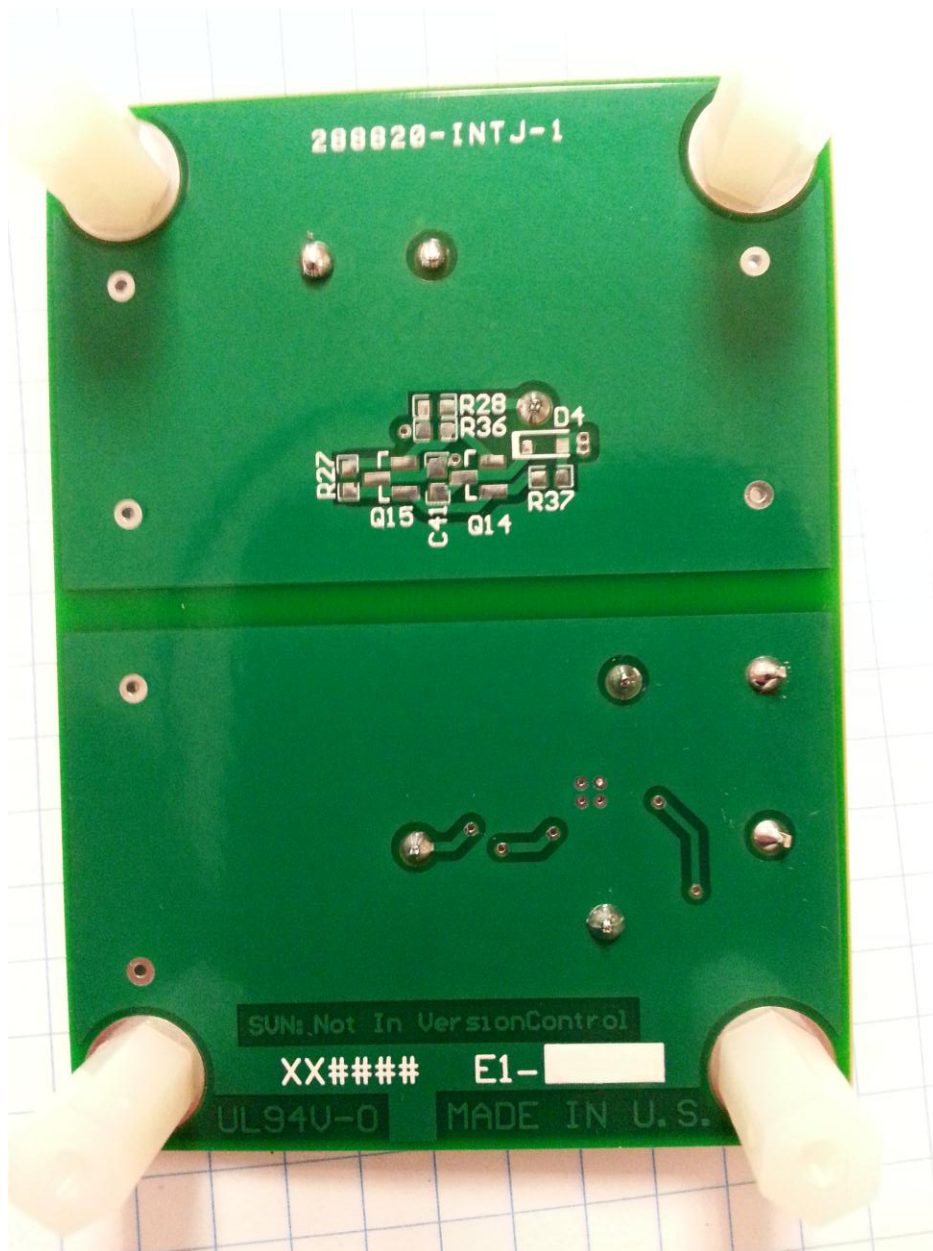
PMP9354 is an Isolated Flybuck Converter which accepts an input voltage of 10.8Vin to 13.2Vin and provides an isolated output of 5Vout capable of supplying a maximum of 0.3A of current to the load. This design was built on the PMP9291 PCB (4-layered board). This is a simple, low-BOM-count, and low-cost design providing an isolated output using a readily-available off-the-shelf VERSA-PAC series transformer.

3. PMP9354 Board Photos

Board Dimensions: 2" x 2.7"

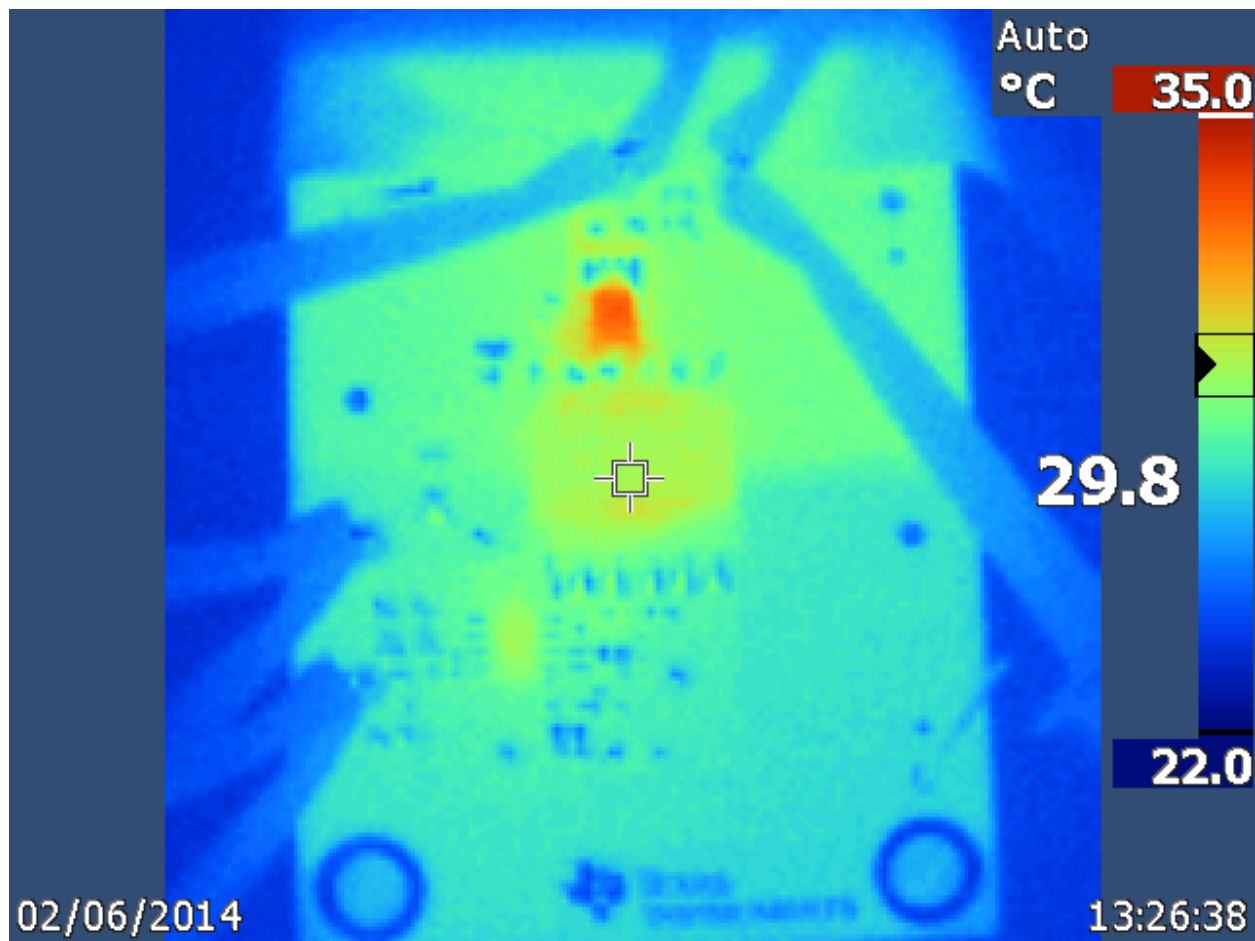


Board Photo (Top)



Board Photo (Bottom)

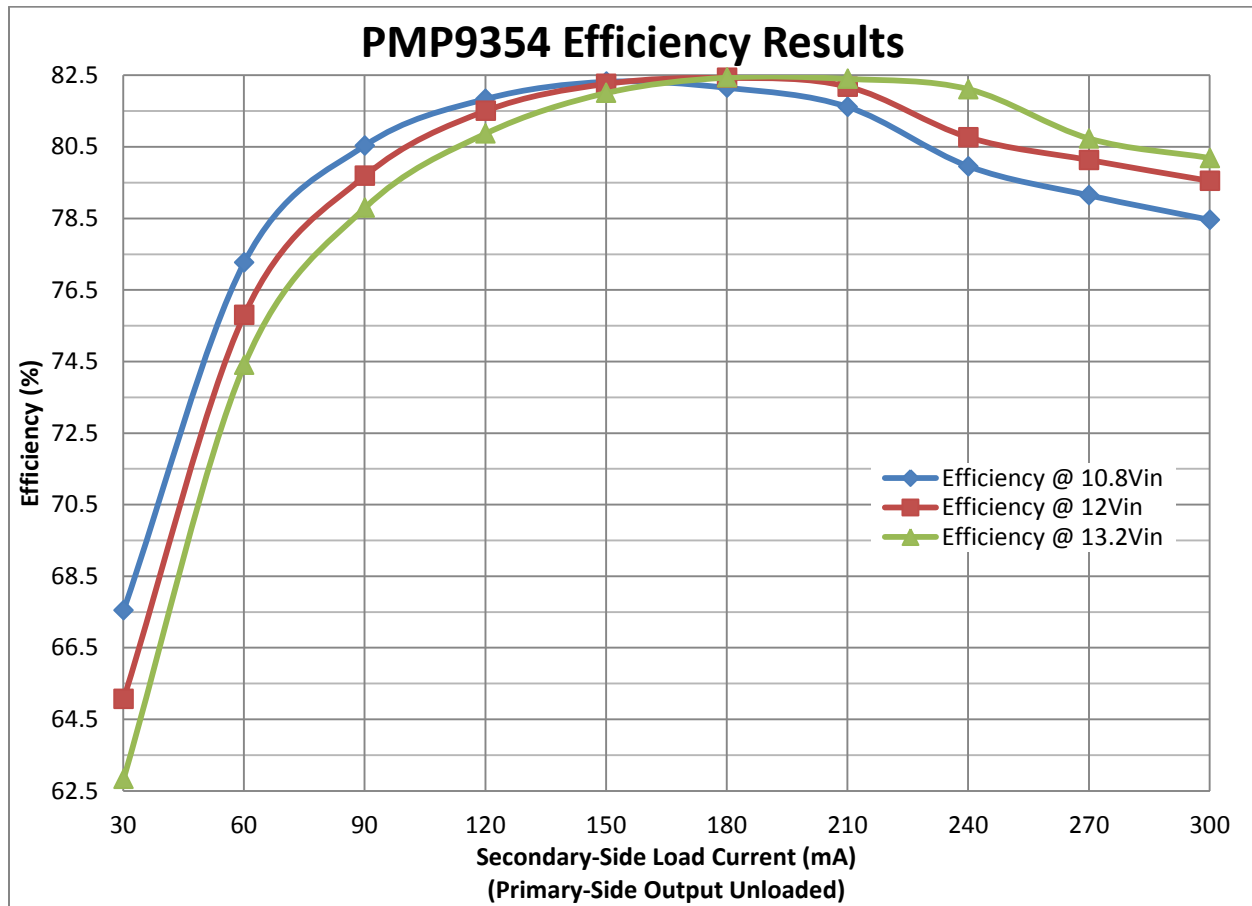
4. Thermal Data



IR thermal image taken at steady state with 12Vin and 0.3A load (no airflow)

5. Efficiency and Line/Load Regulation

5.1 Efficiency Chart



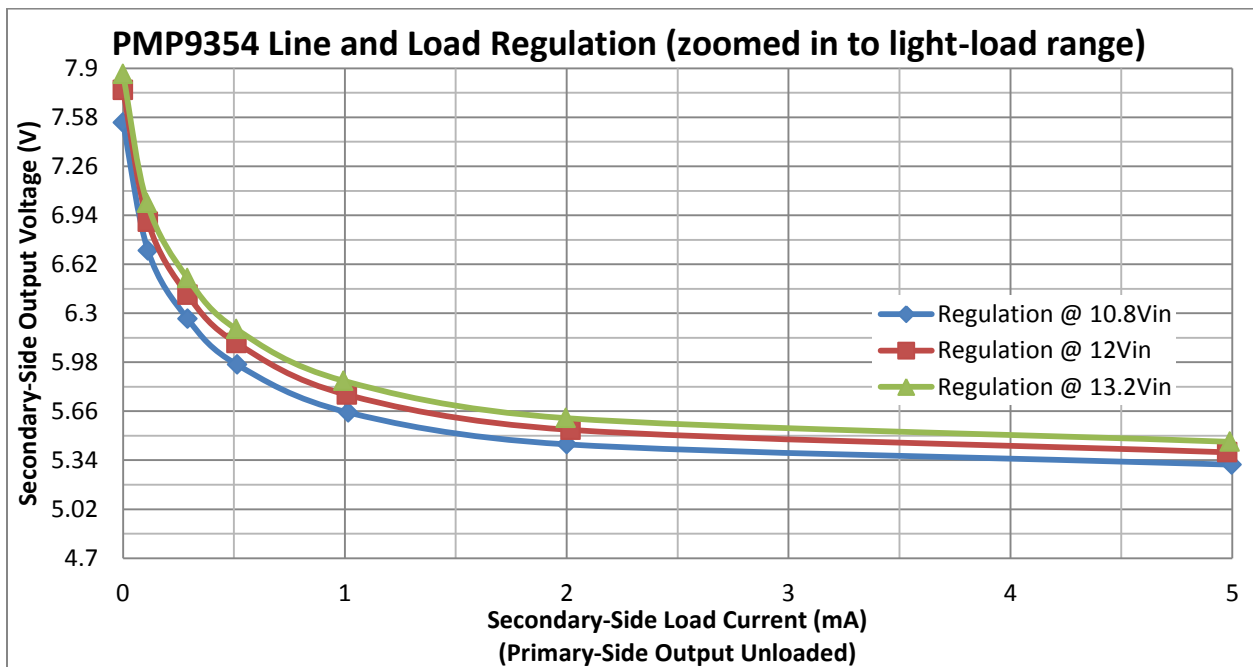
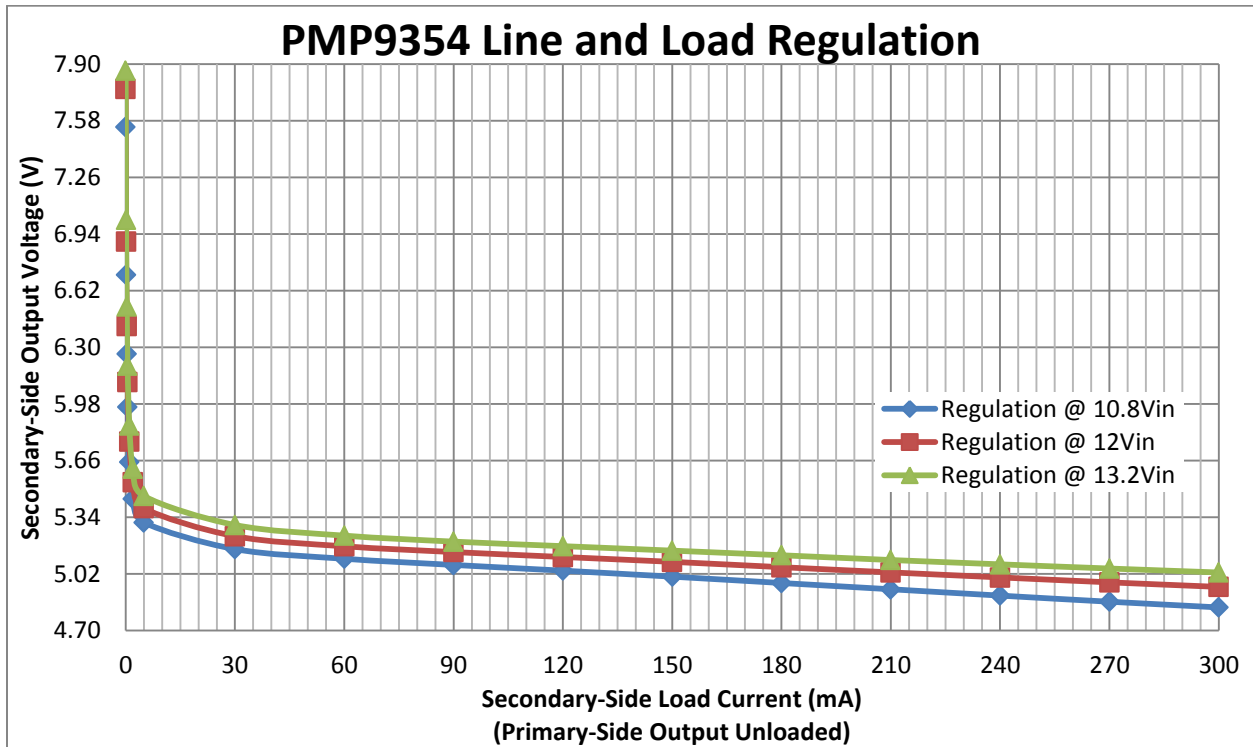
5.2 Efficiency and Line/Load Regulation Data

Vin (V)	Iin (mA)	Vout (V)	Iout (mA)	Pin (W)	Pout (W)	Efficiency (%)
10.8	6.0986	7.5456	0	0.065865	0	
10.8	6.15	6.71	0.1125	0.06642	0.000755	
10.8	6.2385	6.263	0.2915	0.067376	0.001826	
10.8	6.3458	5.964	0.5145	0.068535	0.003068	
10.8	6.588	5.652	1.015	0.07115	0.005737	
10.8	7.077	5.4436	2	0.076432	0.010887	
10.8	8.5653	5.3111	4.9973	0.092505	0.026541	
10.8	21.205	5.1606	29.992	0.229014	0.154777	67.6
10.8	36.692	5.106	59.998	0.396274	0.30635	77.3
10.8	52.445	5.071	90	0.566406	0.45639	80.6
10.8	68.376	5.0388	119.995	0.738461	0.604631	81.9
10.8	84.412	5.0048	150.02	0.91165	0.75082	82.4
10.8	100.774	4.969	180.02	1.088359	0.894519	82.2
10.8	117.487	4.9337	210	1.26886	1.036077	81.7
10.8	136.07	4.8978	240.02	1.469556	1.17557	80.0
10.8	153.55	4.8634	270	1.65834	1.313118	79.2
10.8	170.96	4.8312	300	1.846368	1.44936	78.5

Vin (V)	Iin (mA)	Vout (V)	Iout (mA)	Pin (W)	Pout (W)	Efficiency (%)
12	6.3992	7.7593	0	0.07679	0	
12	6.44	6.898	0.112	0.07728	0.000773	
12	6.519	6.42	0.291	0.078228	0.001868	
12	6.615	6.105	0.5125	0.07938	0.003129	
12	6.839	5.7675	1.01	0.082068	0.005825	
12	7.281	5.5383	2.018	0.087372	0.011176	
12	8.629	5.3917	4.978	0.103548	0.02684	
12	20.1	5.2334	30.007	0.2412	0.157039	65.1
12	34.124	5.1765	59.996	0.409488	0.310569	75.8
12	48.387	5.1438	89.999	0.580644	0.462937	79.7
12	62.748	5.116	120.02	0.752976	0.614022	81.5
12	77.28	5.0885	149.99	0.92736	0.763224	82.3
12	92.012	5.0584	180.01	1.104144	0.910563	82.5
12	107.038	5.029	210	1.284456	1.05609	82.2
12	123.77	5.0006	240	1.48524	1.200144	80.8
12	139.56	4.9727	270	1.67472	1.342629	80.2
12	155.4	4.9471	300	1.8648	1.48413	79.6

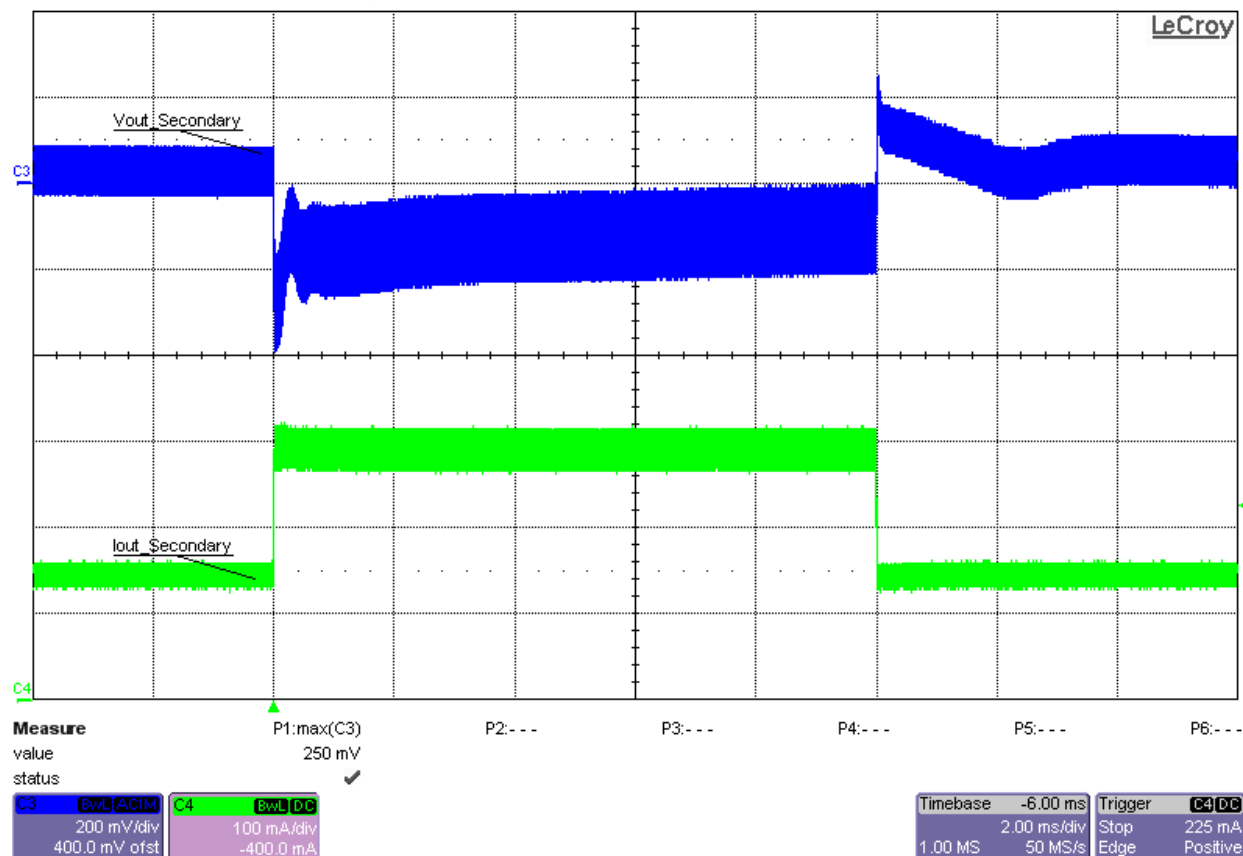
Vin (V)	Iin (mA)	Vout (V)	Iout (mA)	Pin (W)	Pout (W)	Efficiency (%)
13.2	6.612	7.863	0	0.087278	0	
13.2	6.6492	7.02	0.1085	0.087769	0.000762	
13.2	6.7206	6.53	0.29	0.088712	0.001894	
13.2	6.8102	6.197	0.51	0.089895	0.00316	
13.2	7.006	5.8591	0.994	0.092479	0.005824	
13.2	7.4163	5.615	1.9962	0.097895	0.011209	
13.2	8.6525	5.4602	4.99	0.114213	0.027246	
13.2	19.15	5.2966	30.007	0.25278	0.158935	62.9
13.2	31.979	5.2366	60.01	0.422123	0.314248	74.4
13.2	44.997	5.2029	89.996	0.59396	0.46824	78.8
13.2	58.165	5.1772	119.99	0.767778	0.621212	80.9
13.2	71.353	5.152	149.99	0.94186	0.772748	82.0
13.2	84.748	5.1257	180	1.118674	0.922626	82.5
13.2	98.401	5.099	210	1.298893	1.07079	82.4
13.2	112.31	5.0745	240	1.482492	1.21788	82.2
13.2	127.91	5.0509	270	1.688412	1.363743	80.8
13.2	142.45	5.0285	300	1.88034	1.50855	80.2

5.3 Line and Load Regulation

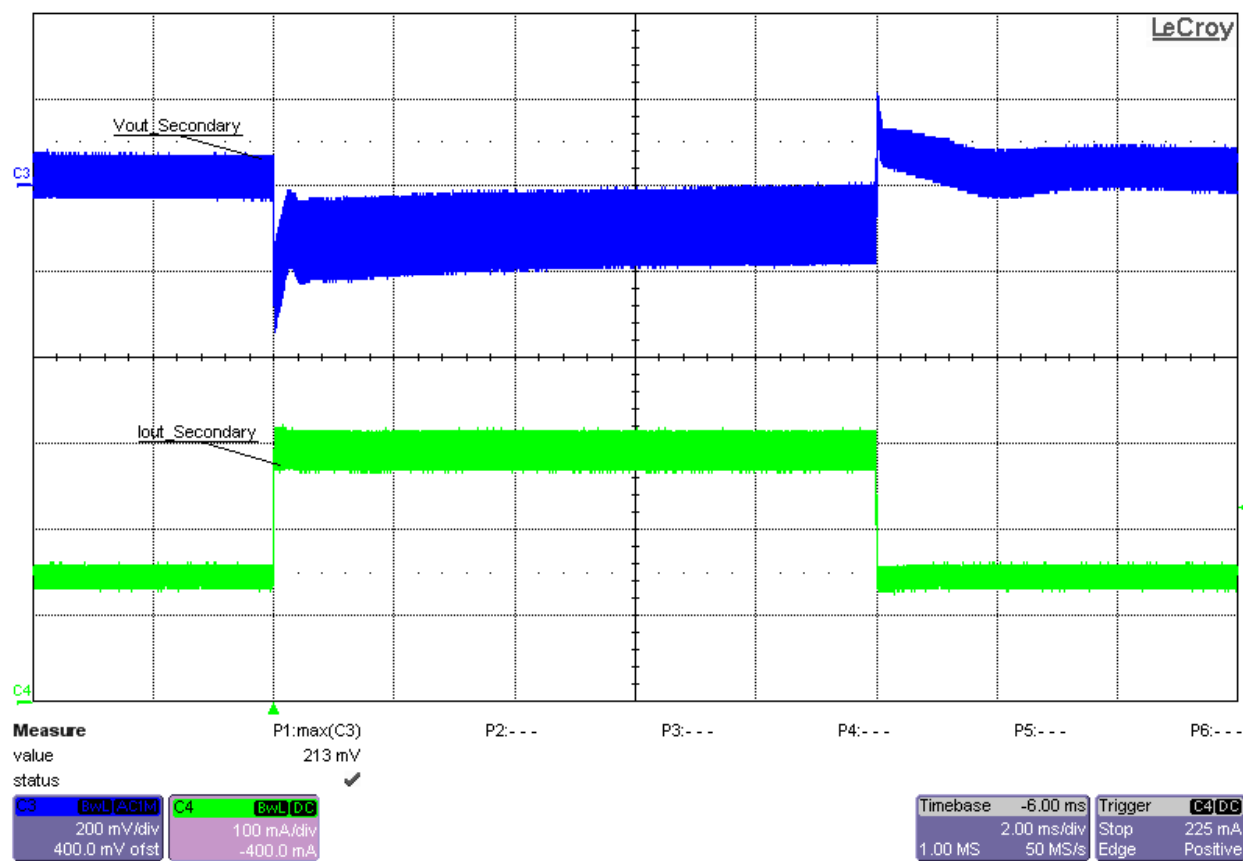


6 Waveforms

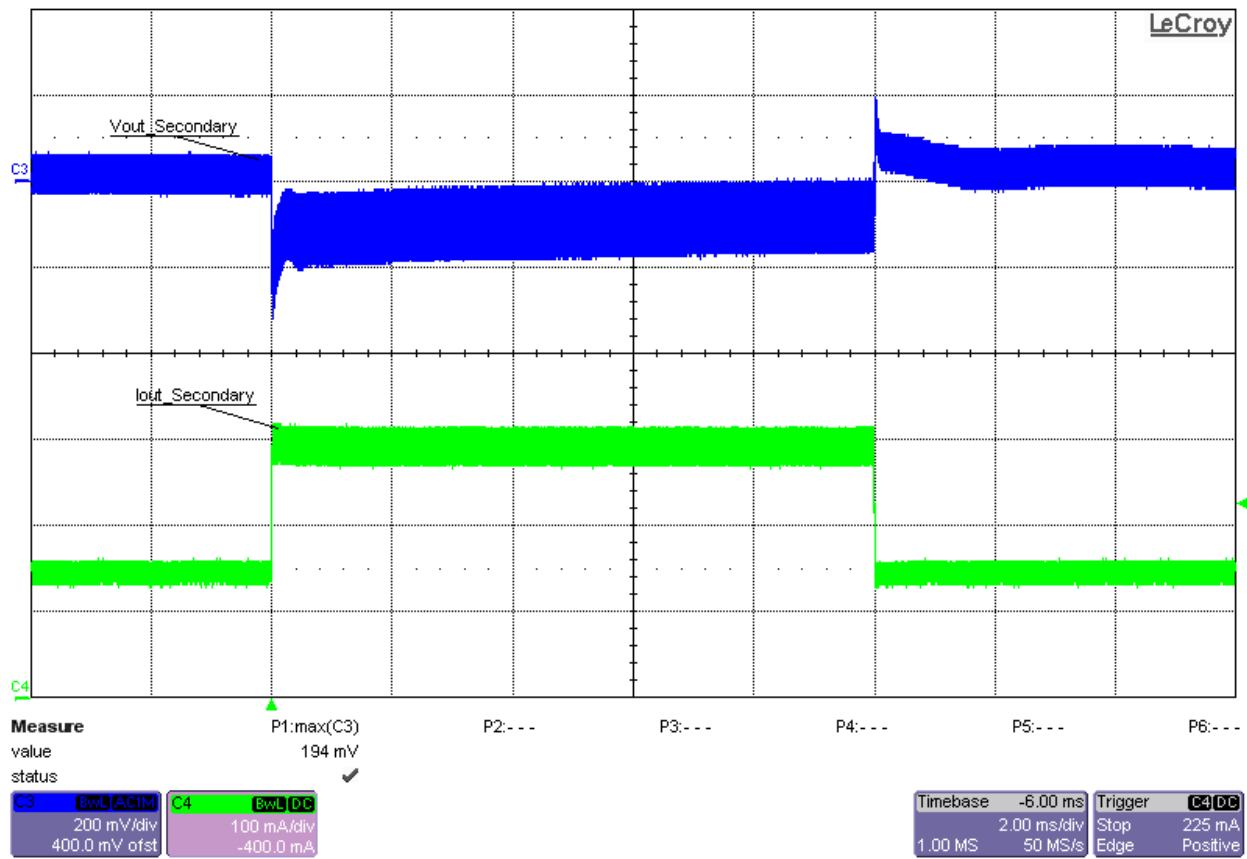
6.1 Load Transient Response



Load Transient Response at 10.8V_{in} and 50%-to-100% (150mA-to-300mA) Load Step

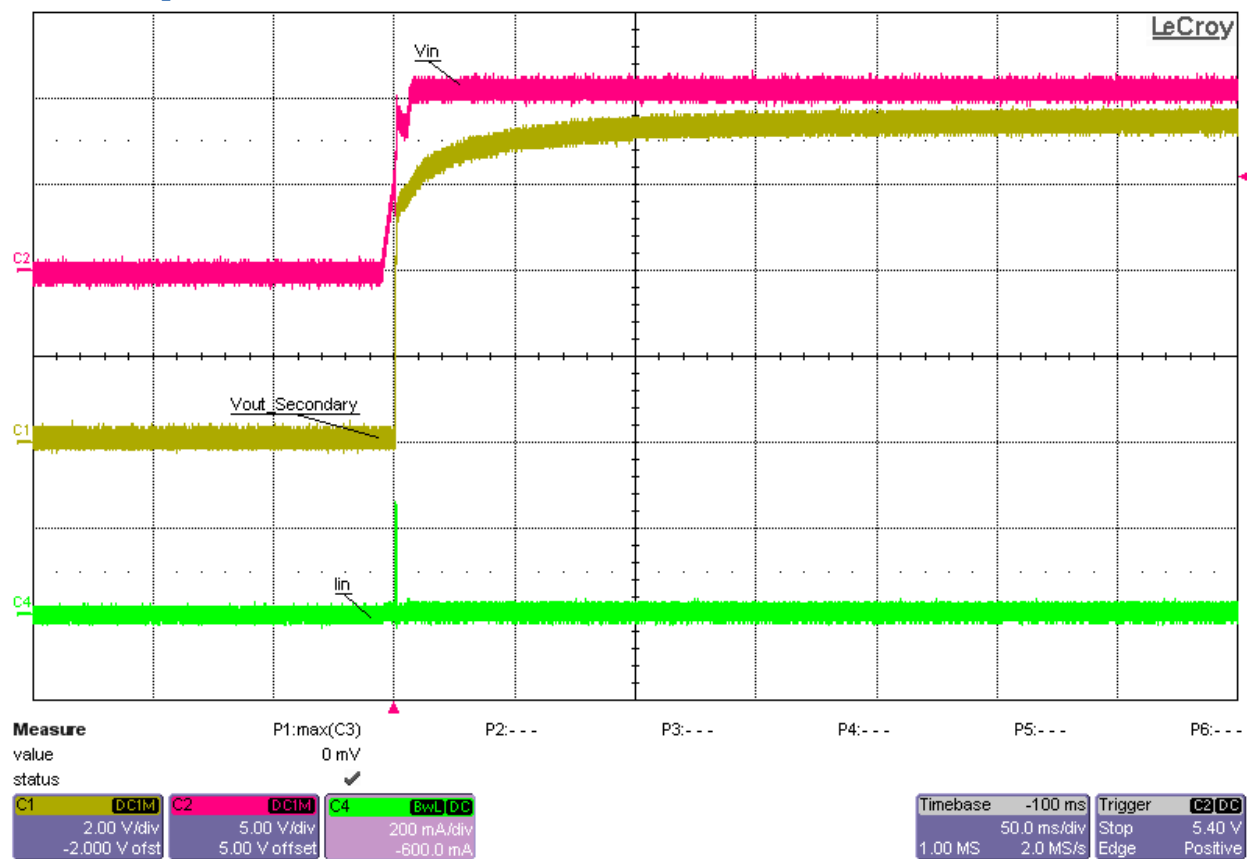


Load Transient Response at 12Vin and 50%-to-100% (150mA-to-300mA) Load Step

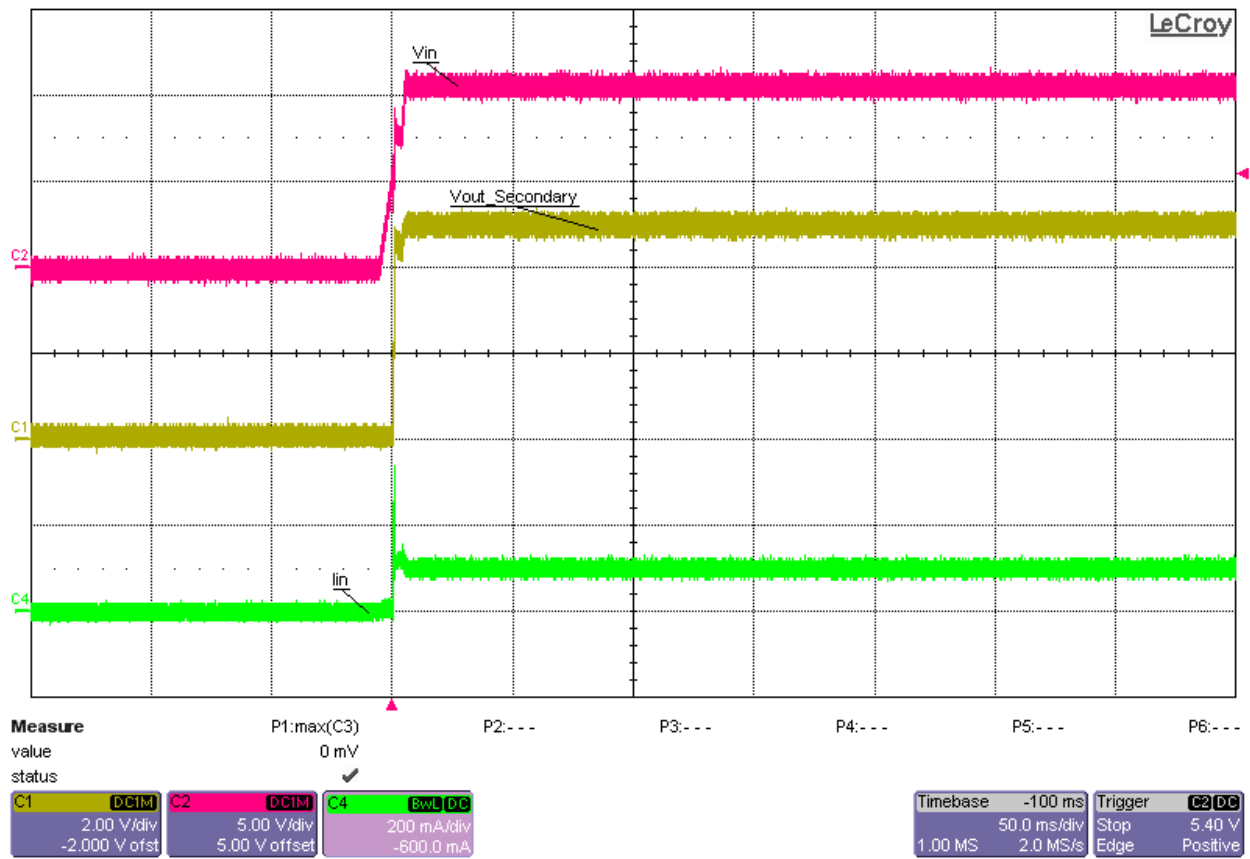


Load Transient Response at 13.2V_{in} and 50%-to-100% (150mA-to-300mA) Load Step

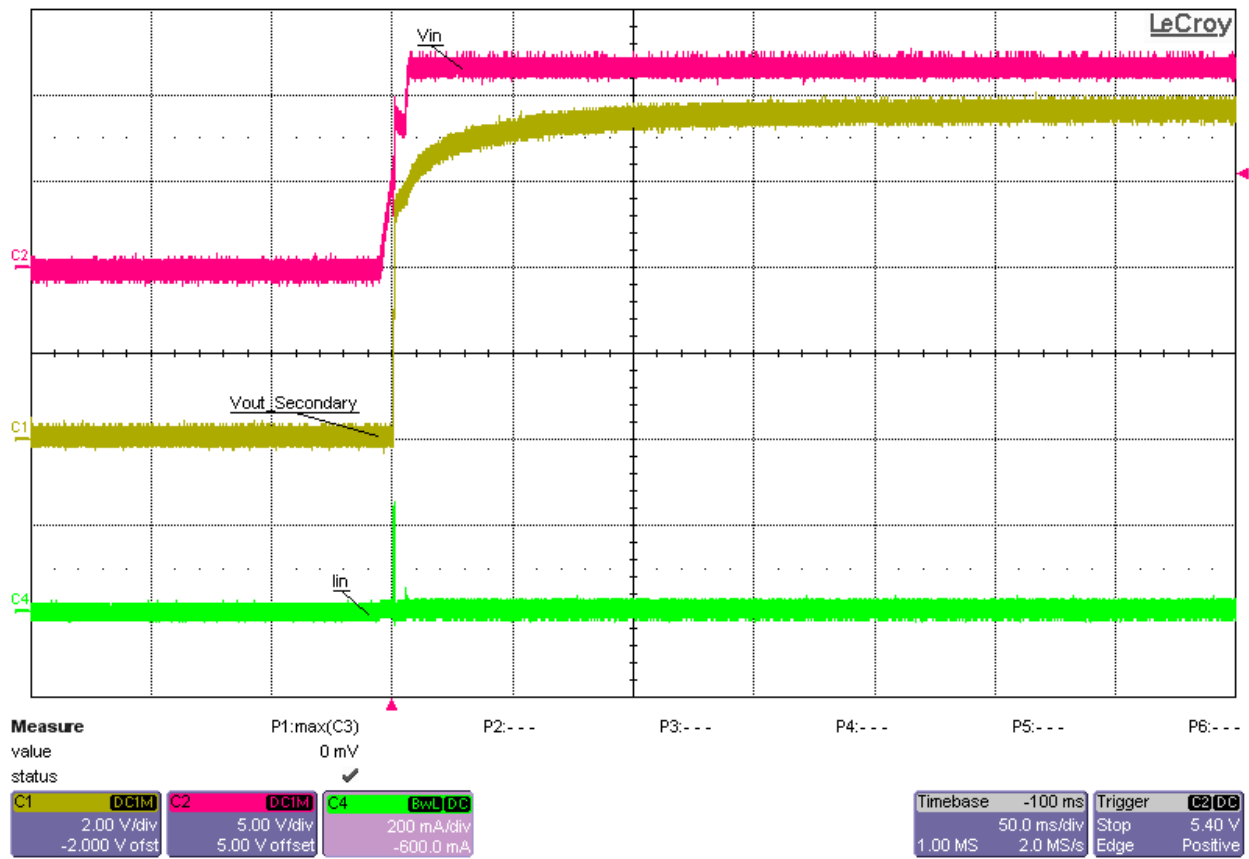
6.2 Startup



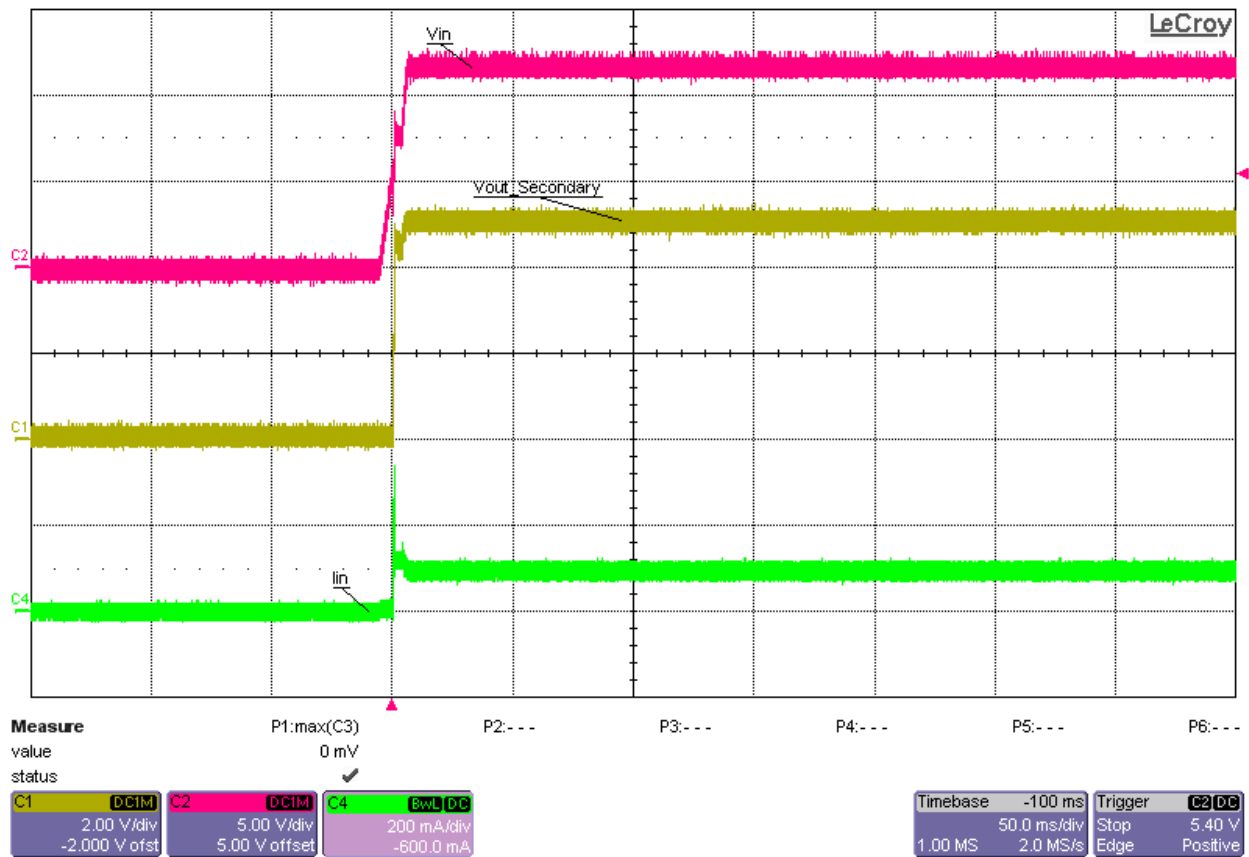
Startup into No Load at 10.8Vin



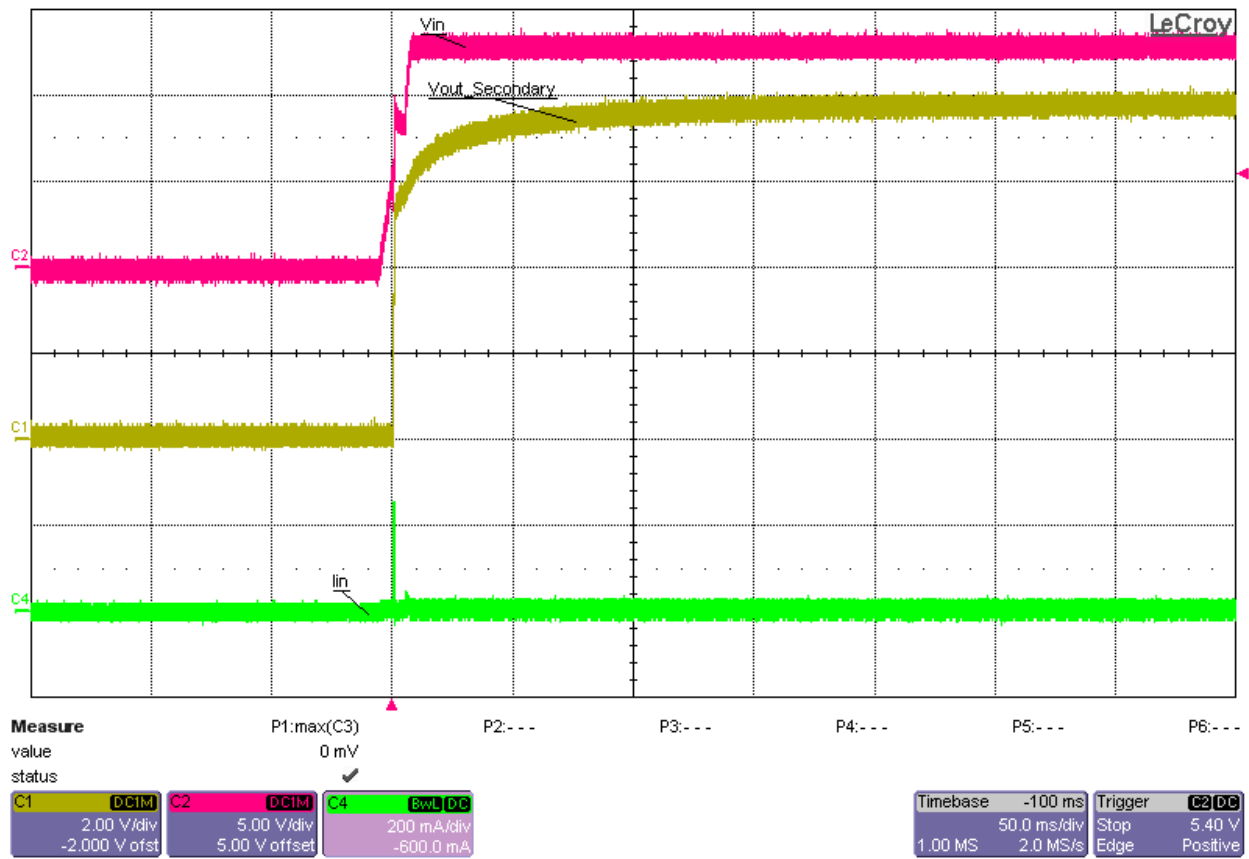
Startup into Full (300mA) Resistive Load at 10.8Vin



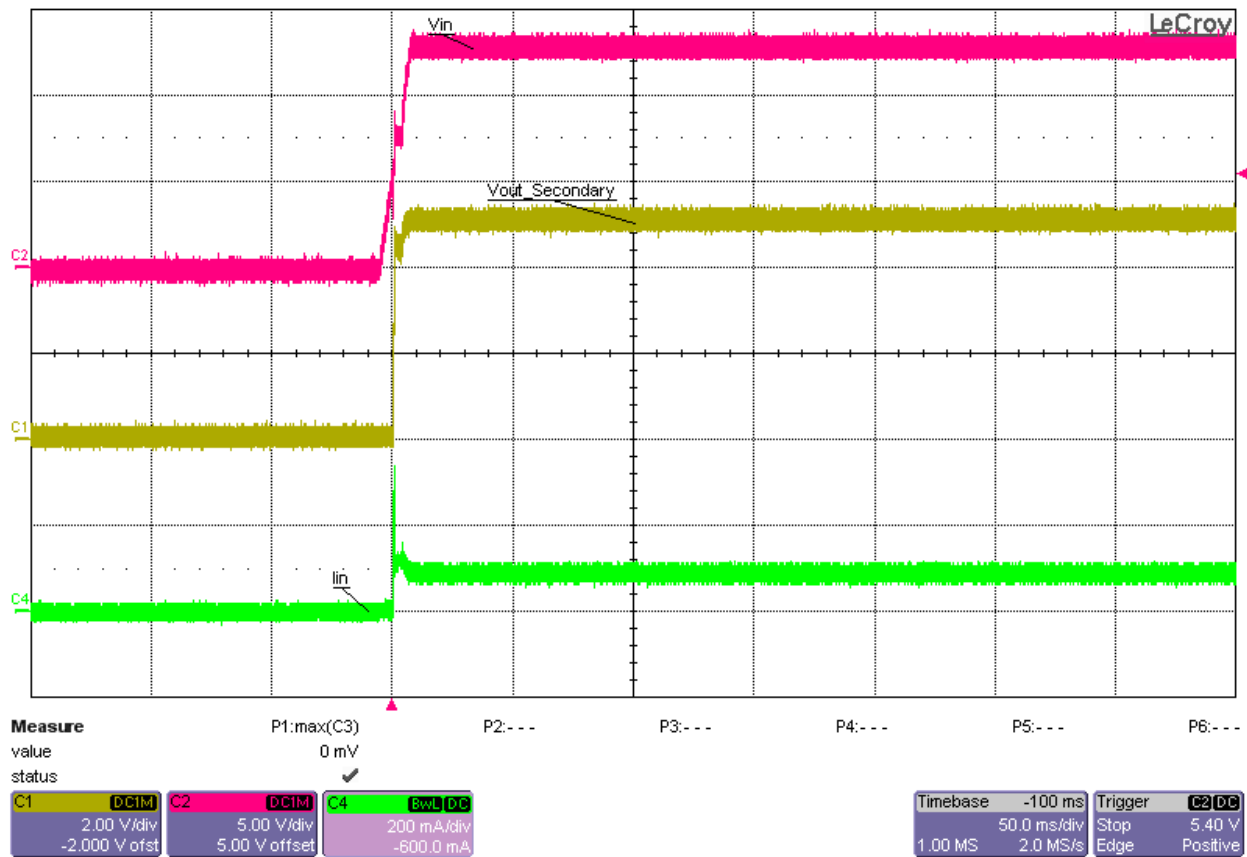
Startup into No Load at 12Vin



Startup into Full (300mA) Resistive Load at 12Vin

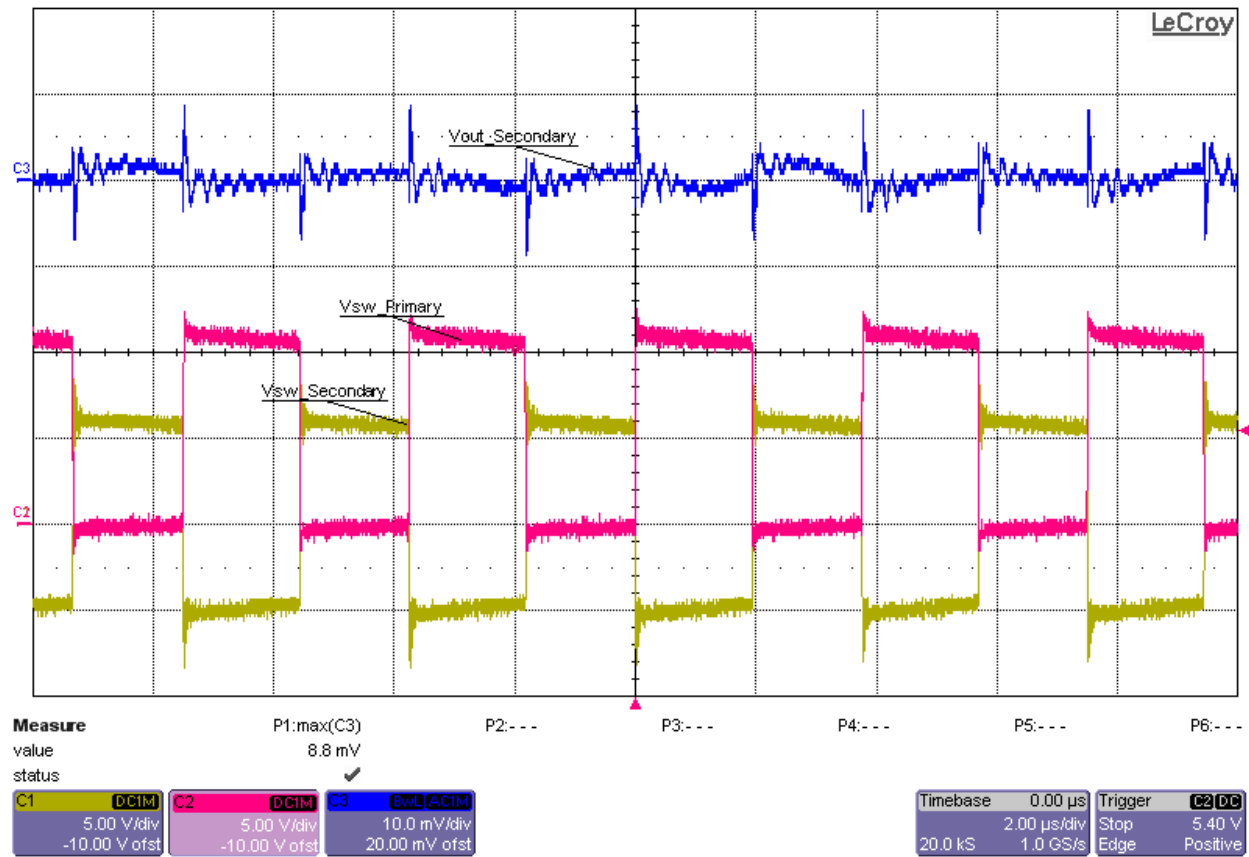


Startup into No Load at 13.2V_{in}

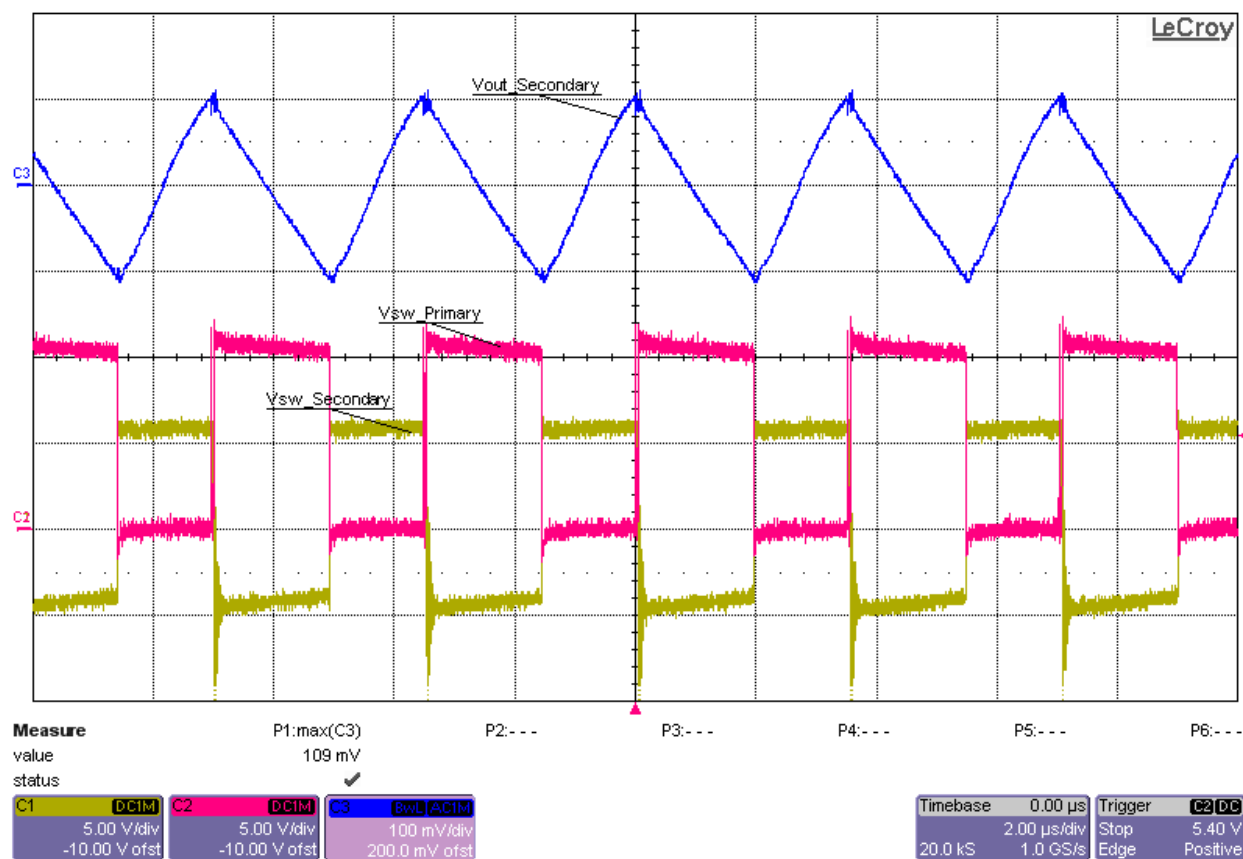


Startup into Full (300mA) Resistive Load at 13.2Vin

6.3 Output Voltage Ripple and Switch Node Voltage

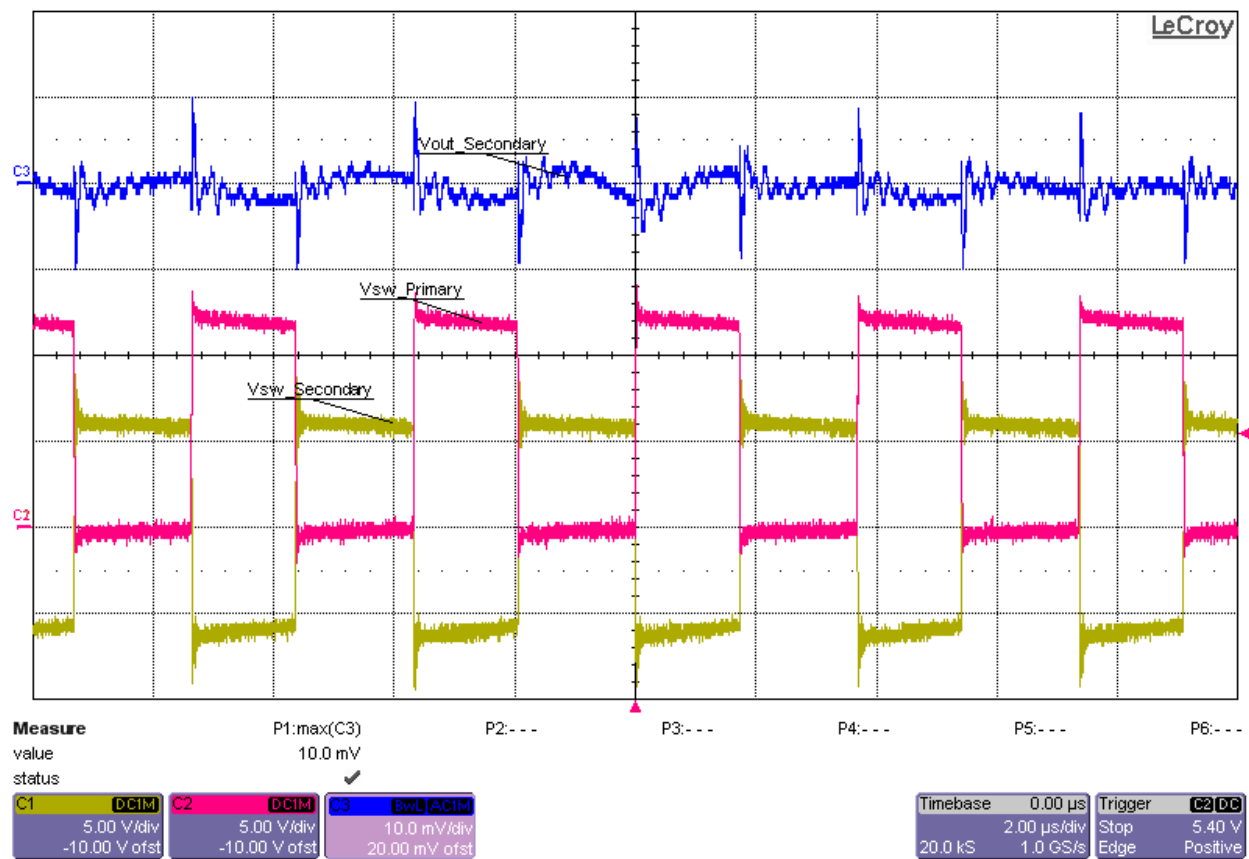


Switch Node and Secondary-Side Output Voltage Ripple at 10.8V_{in} and No Load (V_{ripple} $\approx$ 6mV_{p-p})

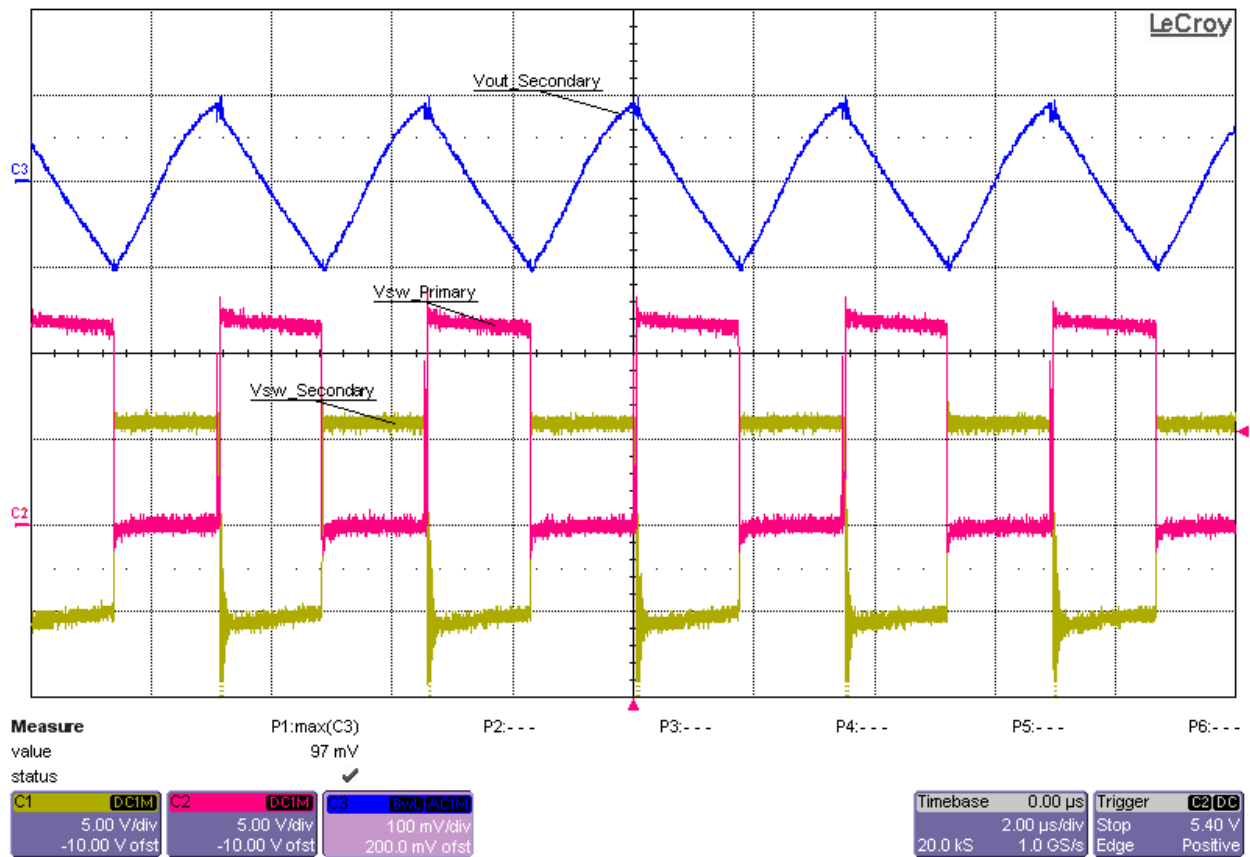


Switch Node and Secondary-Side Output Voltage Ripple at 10.8Vin and Full (300mA) Load

(Vripple $\approx$ 210mVp-p)

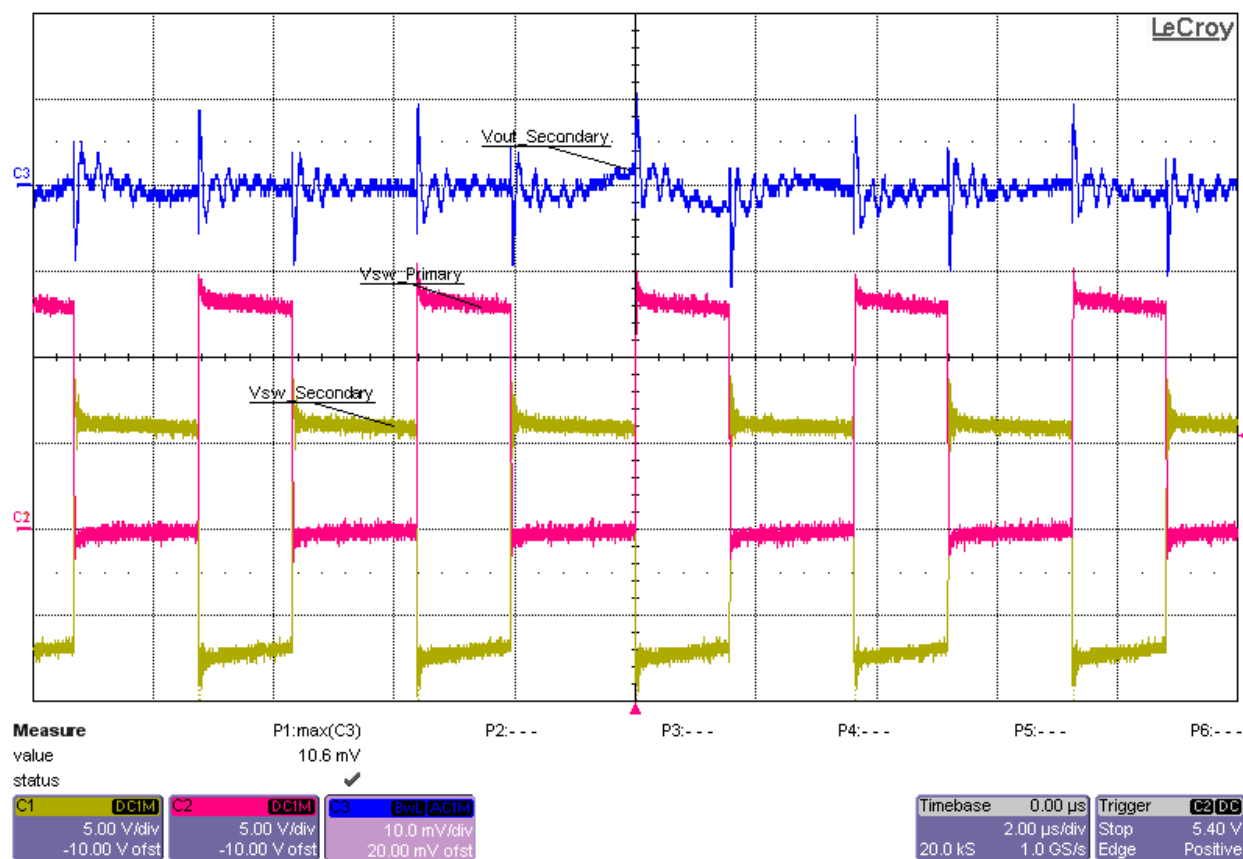


Switch Node and Secondary-Side Output Voltage Ripple at 12Vin and No Load ($V_{ripple} \approx 6mVp-p$)

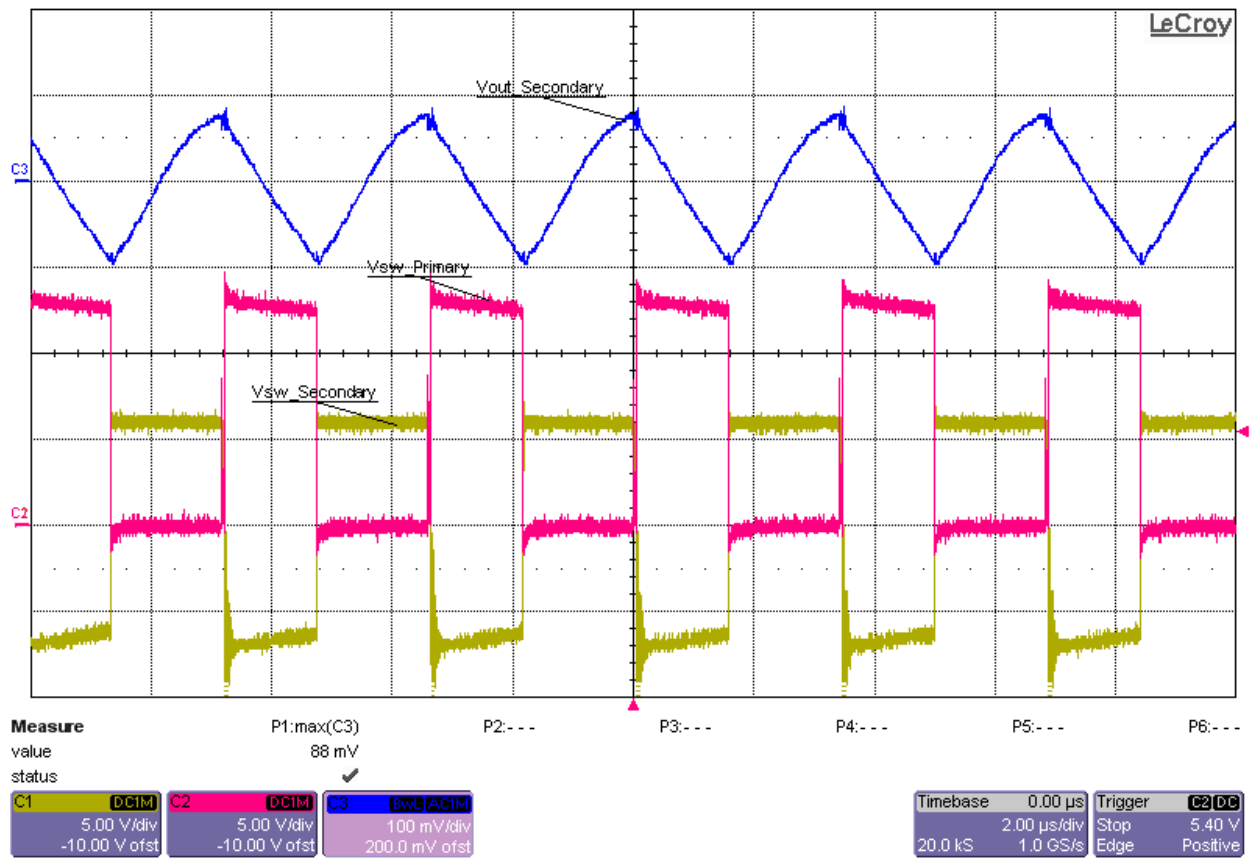


Switch Node and Secondary-Side Output Voltage Ripple at 12Vin and Full (300mA) Load

(Vripple $\approx$ 195mVp-p)



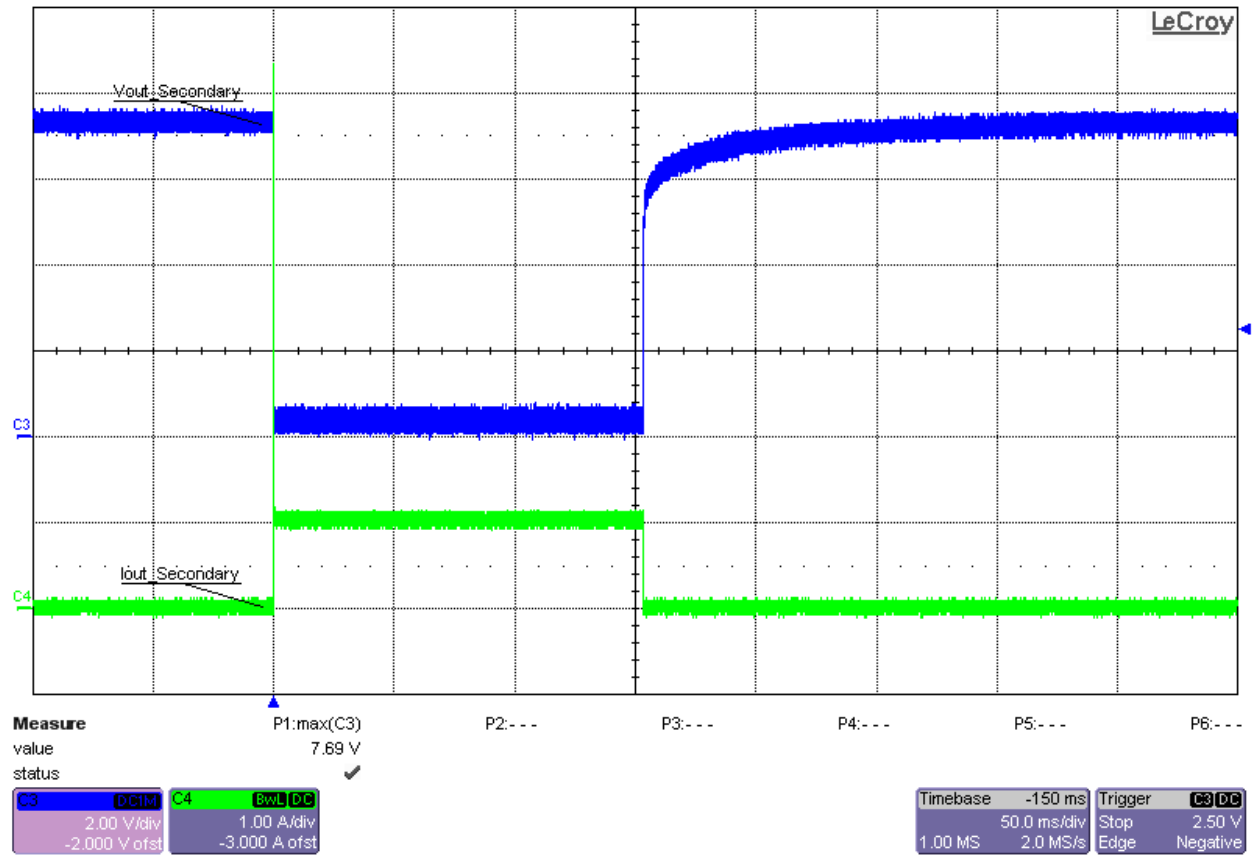
Switch Node and Secondary-Side Output Voltage Ripple at 13.2V_{in} and No Load (V_{ripple} $\approx$ 6mV_{p-p})



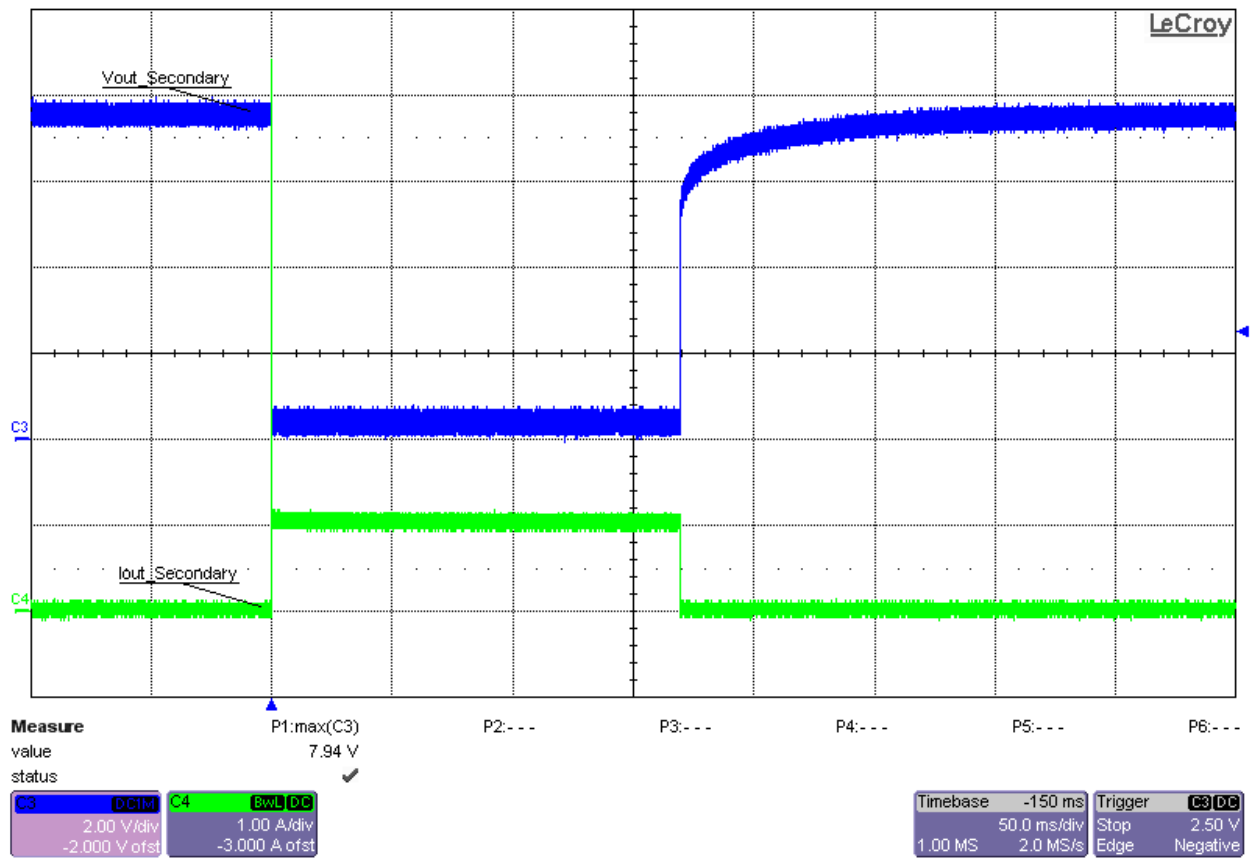
Switch Node and Secondary-Side Output Voltage Ripple at 13.2V_{in} and Full (300mA) Load

(V_{ripple} $\approx$ 180mV_{p-p})

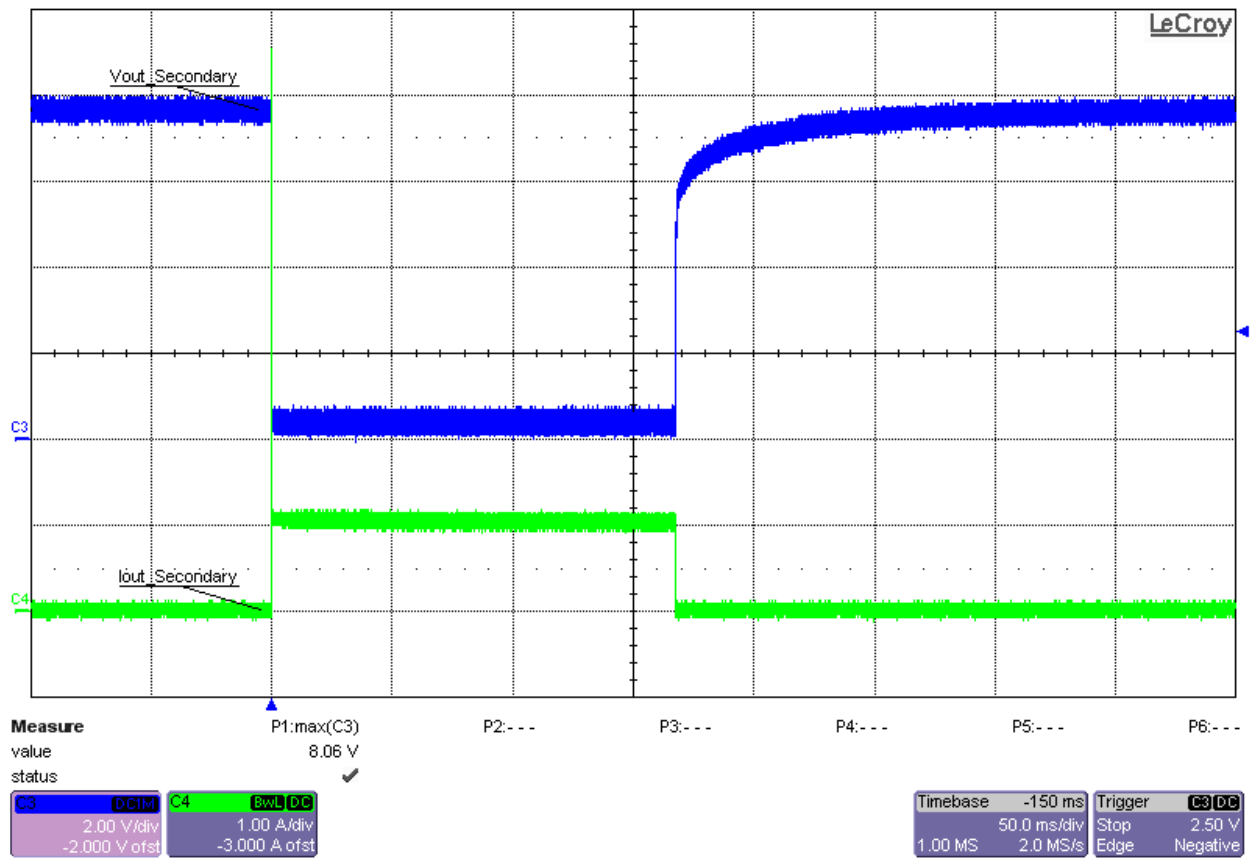
7 Short Circuit Testing



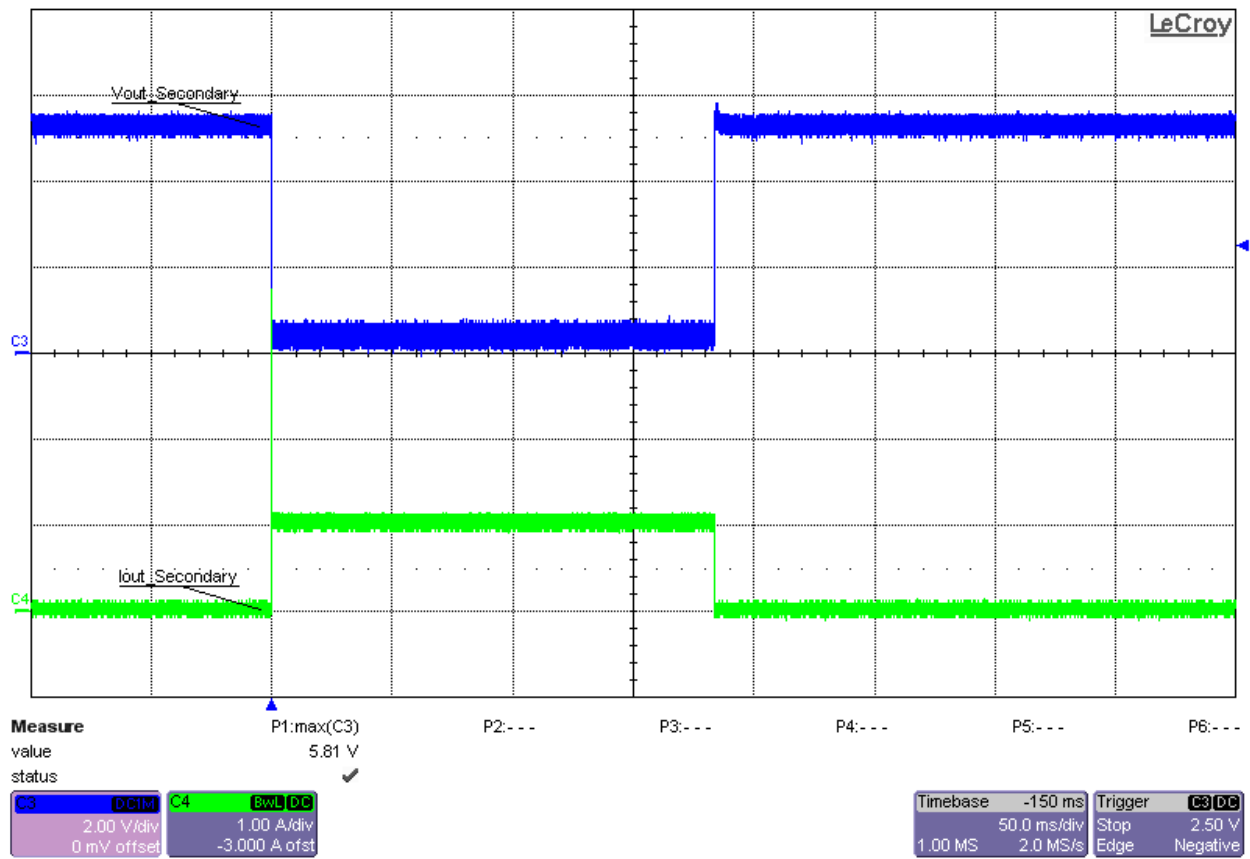
Short Circuit Application and Recovery at 10.8Vin (applied from no load, recovered into no load)



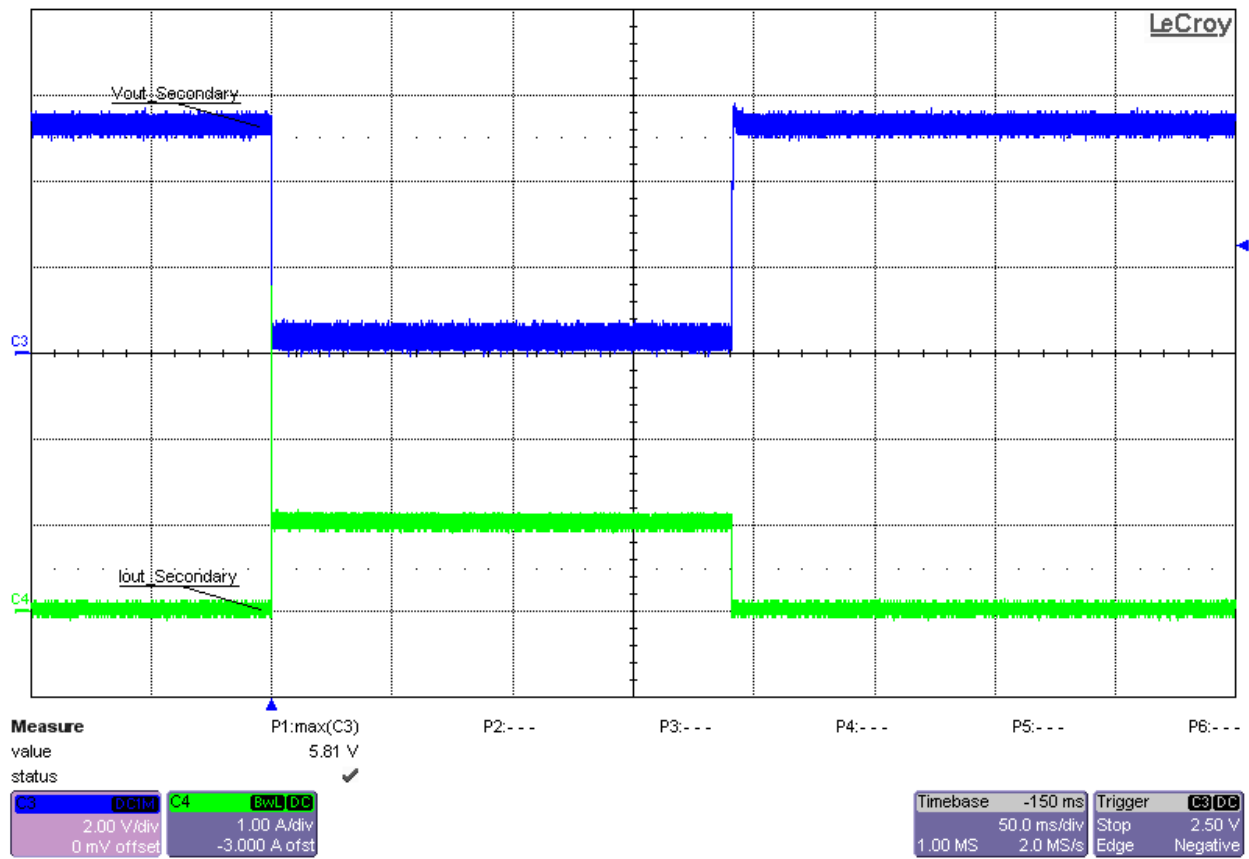
Short Circuit Application and Recovery at 12Vin (applied from no load, recovered into no load)



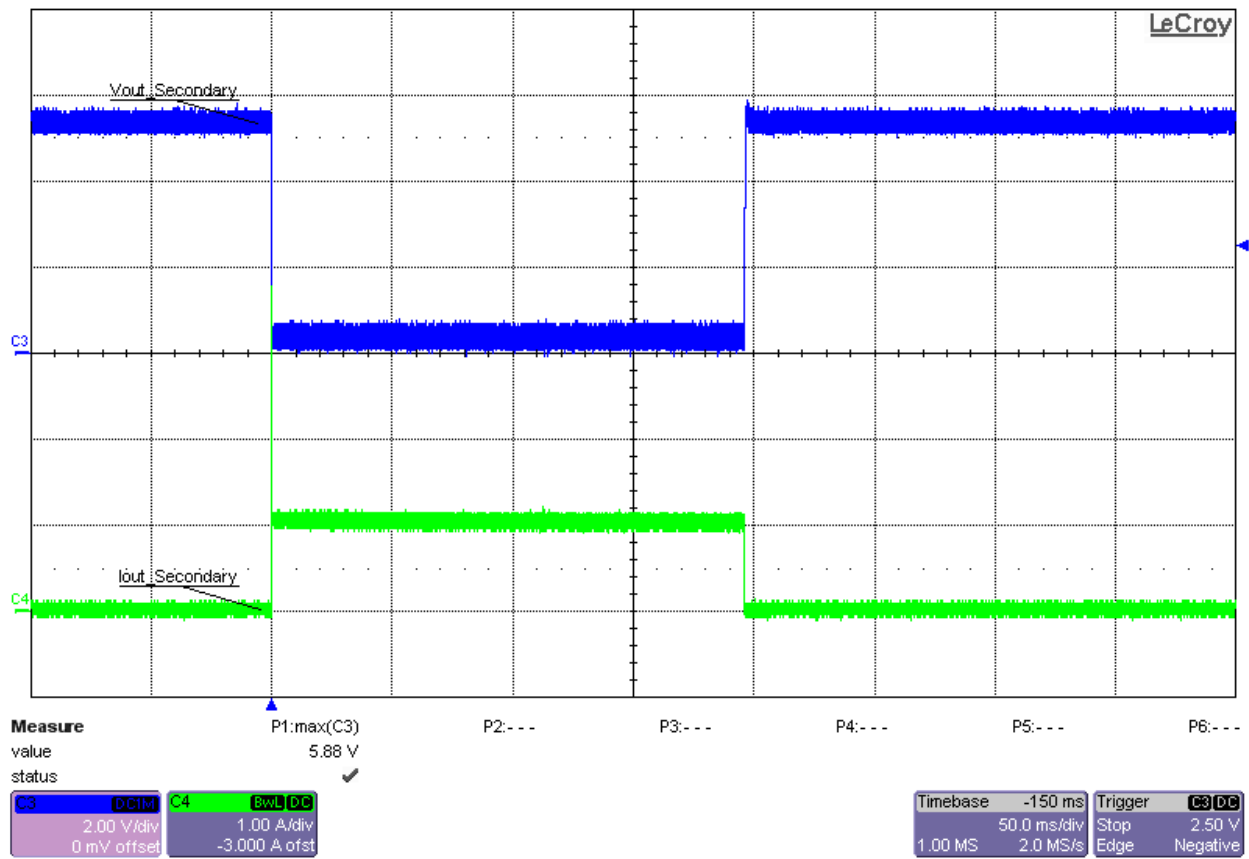
Short Circuit Application and Recovery at 13.2V_{in} (applied from no load, recovered into no load)



Short Circuit Application and Recovery at 10.8Vin (applied from 5mA load, recovered into 5mA load)



Short Circuit Application and Recovery at 12Vin (applied from 5mA load, recovered into 5mA load)



Short Circuit Application and Recovery at 13.2Vin (applied from 5mA load, recovered into 5mA load)

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