Test Data
For PMP10506
11/5/2014

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1. Design Specifications

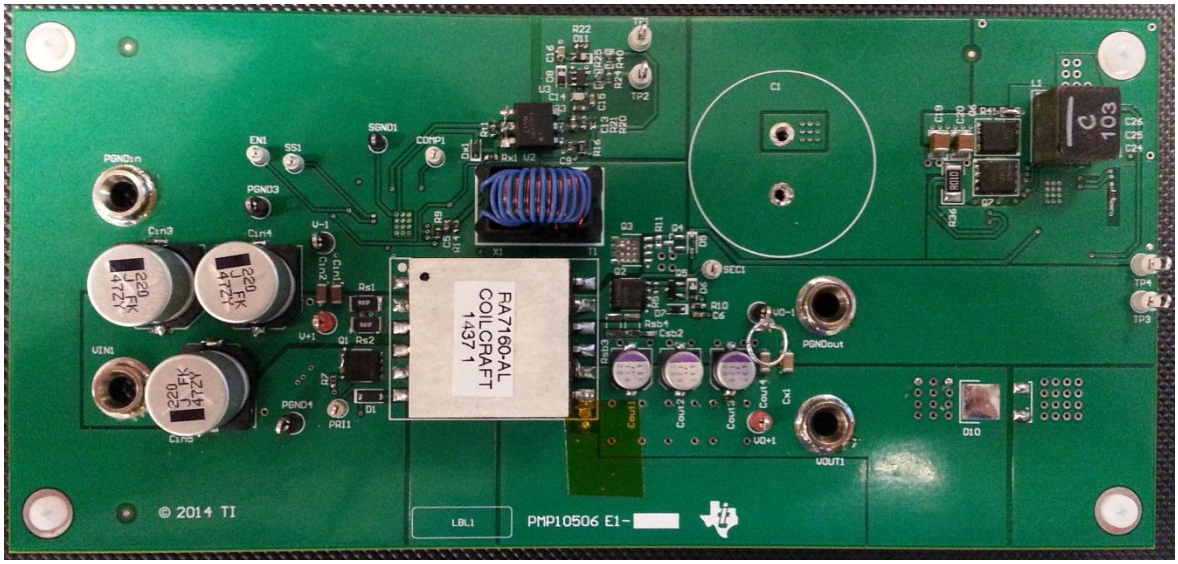
Vin Minimum	**9VDC**
Vin Maximum	**60VDC**
Vout	**5VDC**
Iout	**6A Max.**
Nominal Switching Frequency	**≈ 235KHz**

2. Circuit Description

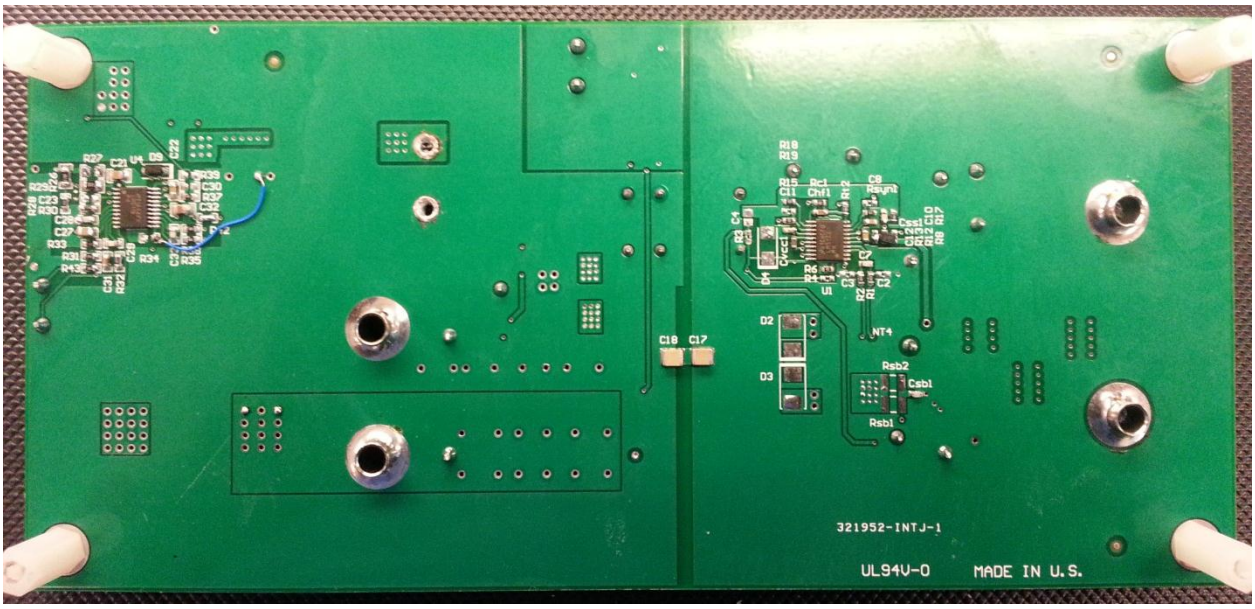
PMP10506 is an Isolated Synchronous Flyback Converter using the LM5122 controller IC. The design accepts an input voltage of 9Vin to 60Vin and provides an isolated output of 5Vout capable of supplying 6A of current to the load. The nominal switching frequency of the design is 235KHz. The board is a 4-layer PCB with 1 oz. copper on the top and bottom layers and 0.5oz Copper on the two mid-layers. All tests were performed at 9Vin, 24Vin, and 60Vin.

3. PMP10506 Board Photos

Board Dimensions: 3.5” x 7.48”

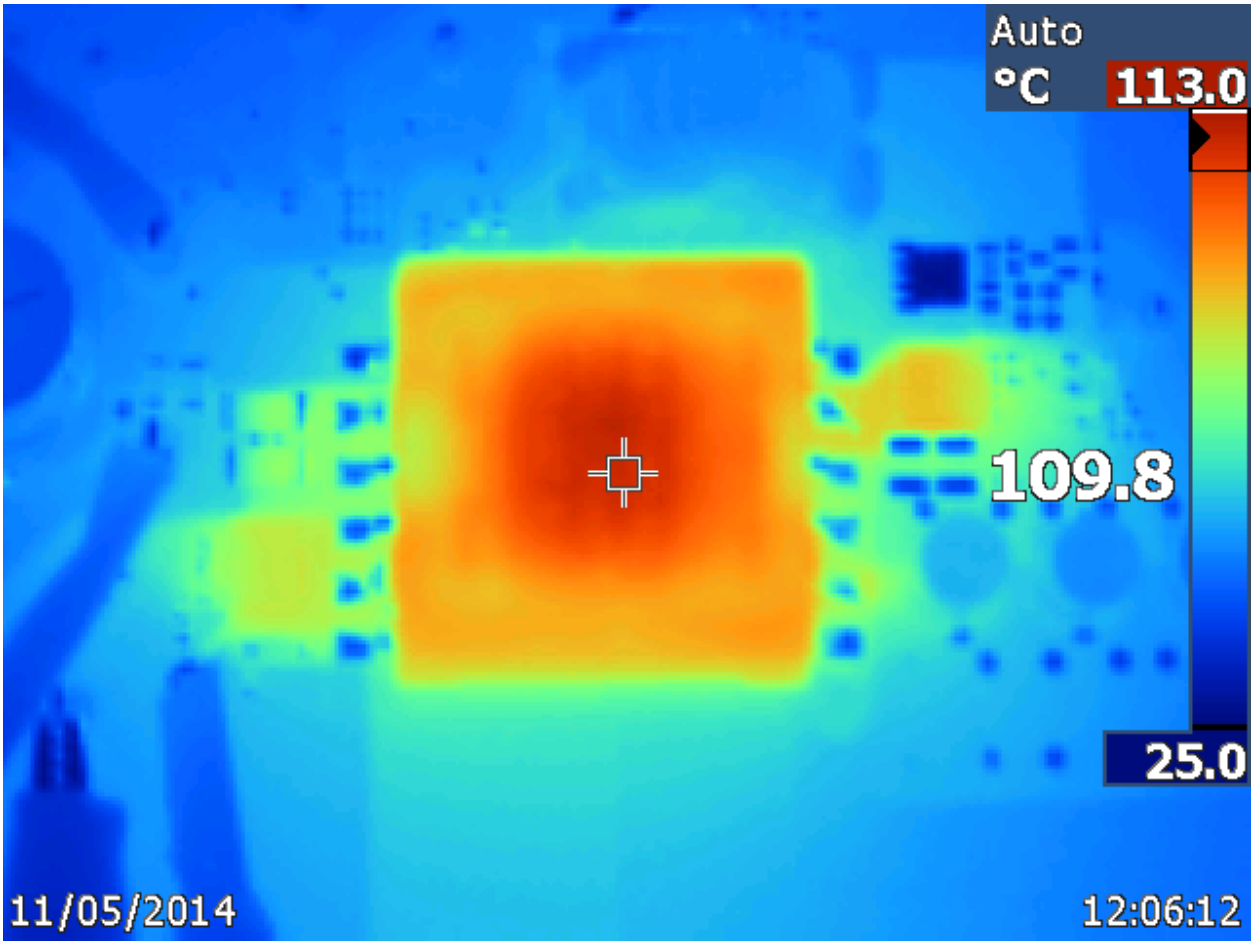


Board Photo (Top)

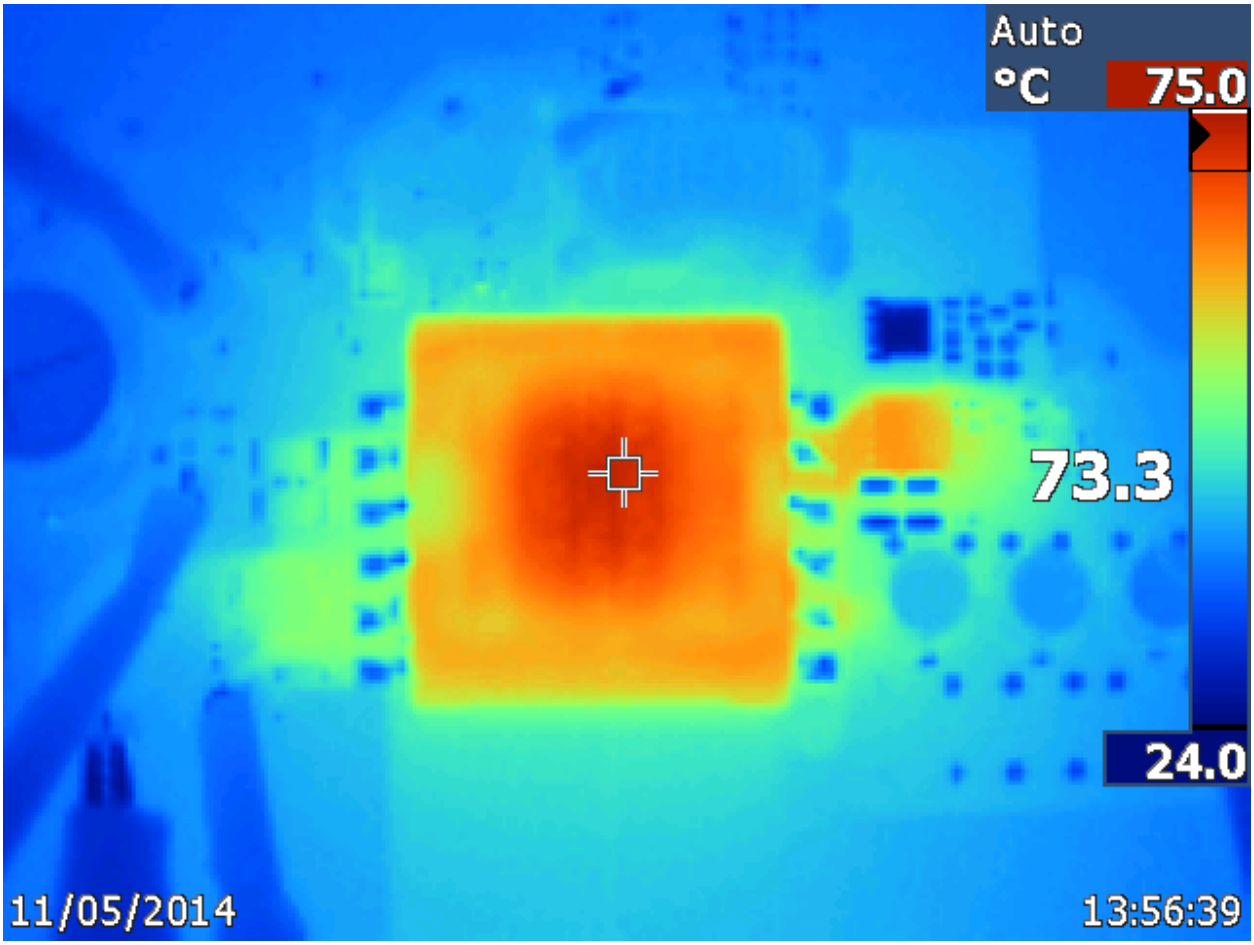


Board Photo (Bottom)

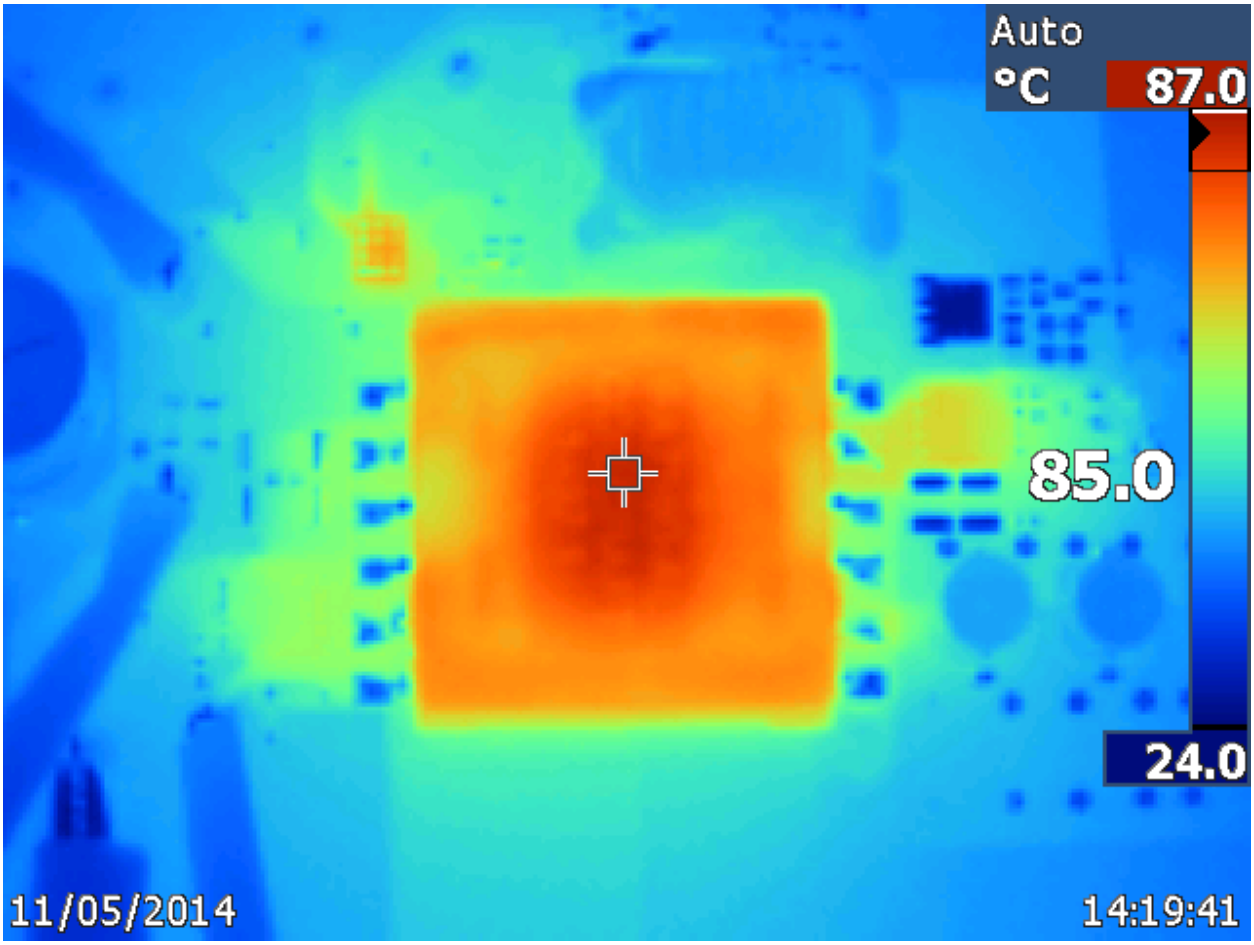
4. Thermal Data



IR Thermal Image Taken at Steady State at 9Vin and Output at Full (6A) Current



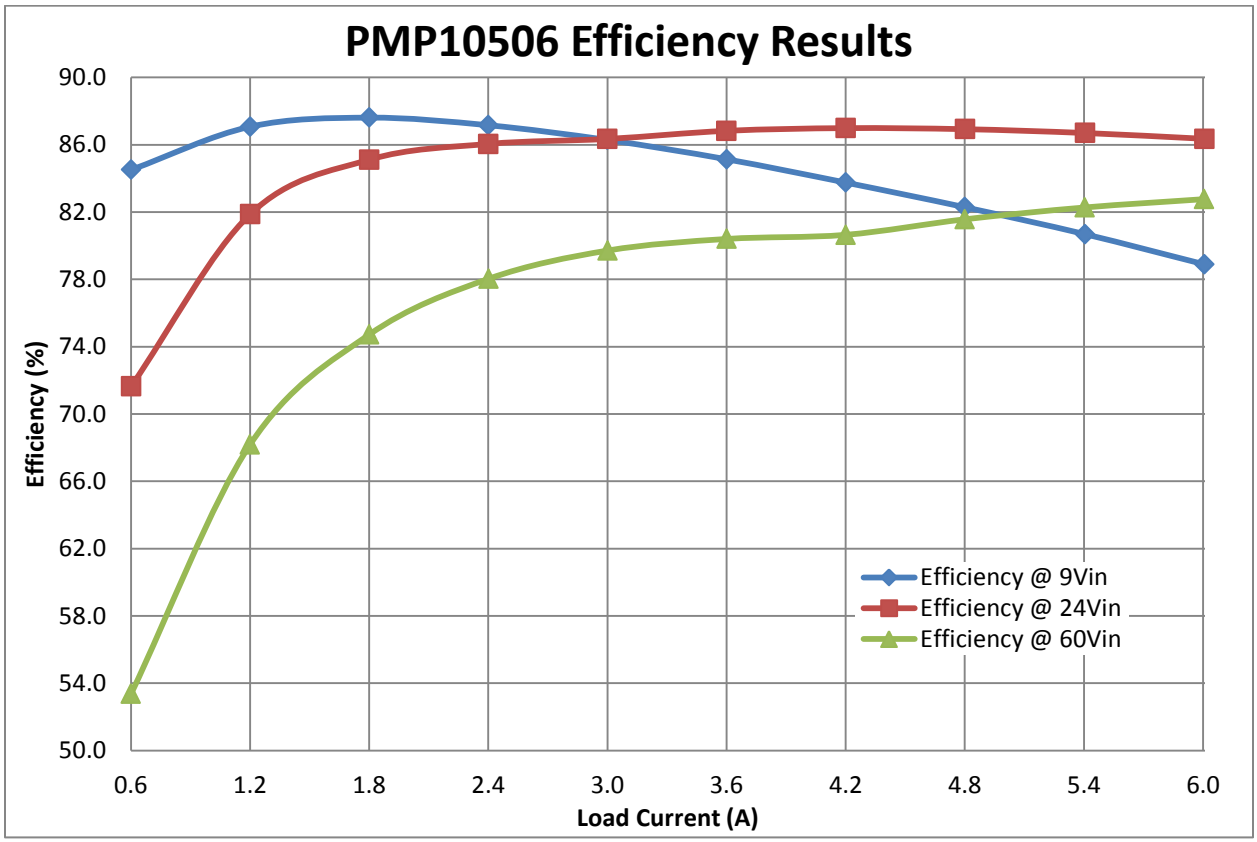
IR Thermal Image Taken at Steady State at 24Vin and Output at Full (6A) Current



IR Thermal Image Taken at Steady State at 60Vin and Output at Full (6A) Current

5. Efficiency

5.1 Efficiency Chart

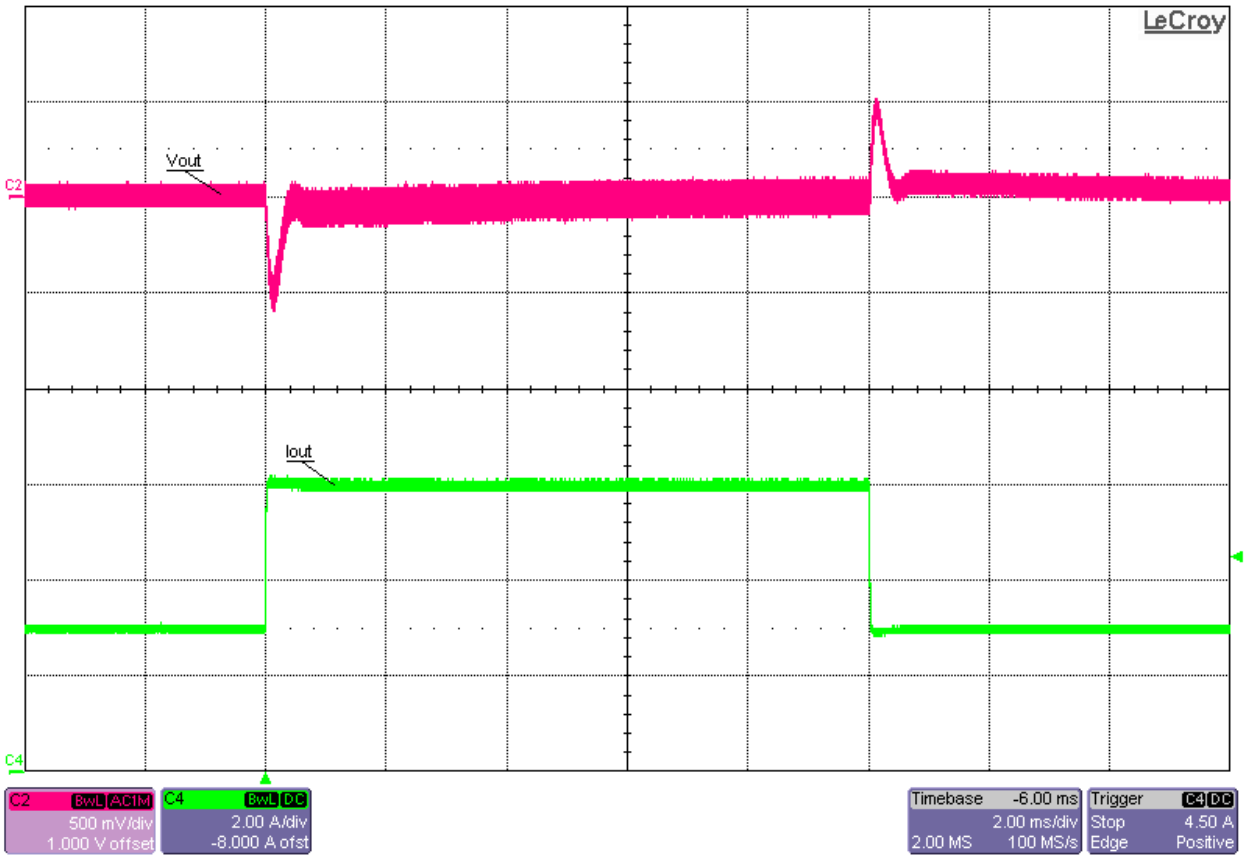


5.2 Efficiency Data

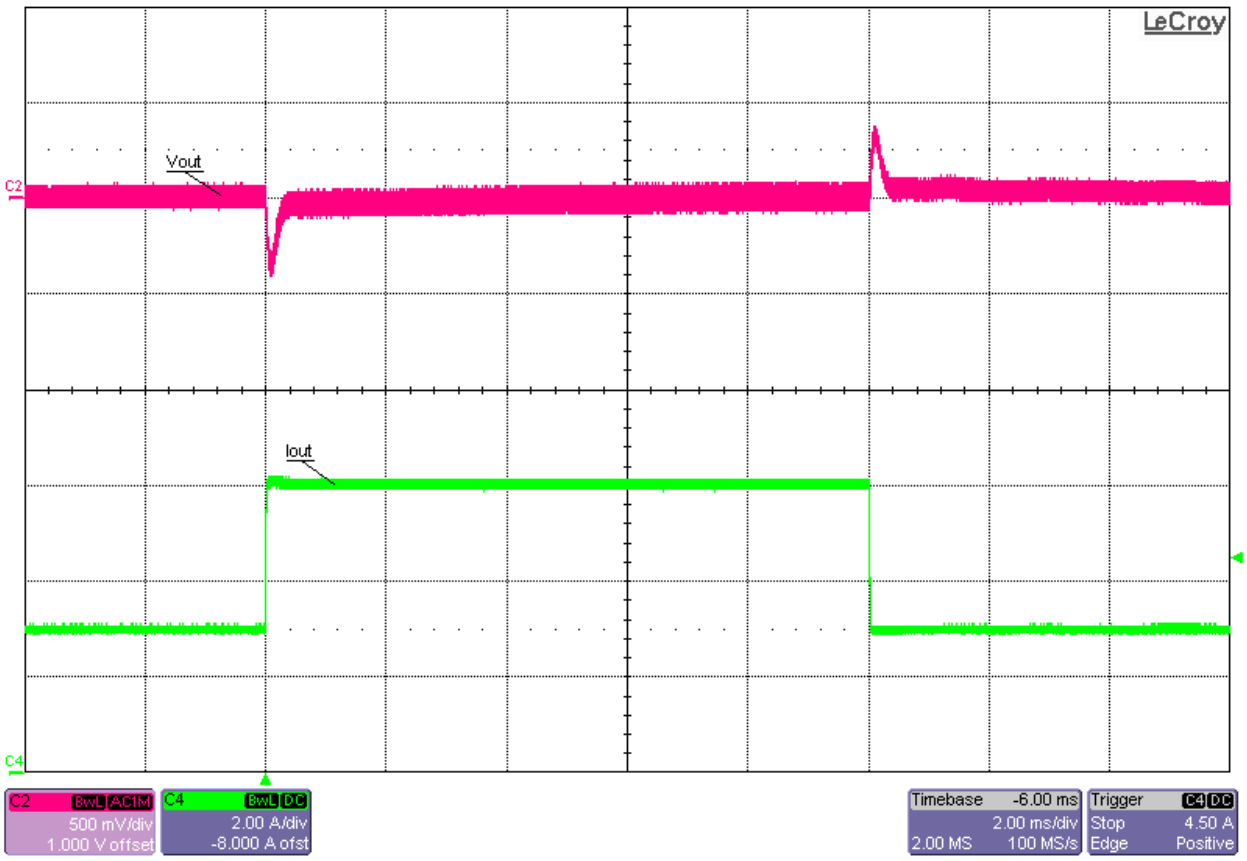
Vin (V)	Iin (A)	Vout (V)	Iout (A)	Pin (W)	Pout (W)	Efficiency (%)
9	0.4086	5.1726	0.6008	3.6774	3.1077	84.5
9	0.7923	5.1718	1.2005	7.1307	6.2087	87.1
9	1.1808	5.171	1.8005	10.6272	9.3104	87.6
9	1.5821	5.1701	2.4004	14.2389	12.4103	87.2
9	1.9973	5.1692	3.0004	17.9757	15.5097	86.3
9	2.4285	5.1683	3.6003	21.8565	18.6074	85.1
9	2.8795	5.1673	4.2003	25.9155	21.7042	83.7
9	3.3486	5.1663	4.8001	30.1374	24.7988	82.3
9	3.8455	5.1653	5.406	34.6095	27.9236	80.7
9	4.3694	5.1642	6.0073	39.3246	31.0229	78.9
Vin (V)	**Iin (A)**	**Vout (V)**	**Iout (A)**	**Pin (W)**	**Pout (W)**	**Efficiency (%)**
24	0.1807	5.1709	0.6008	4.3368	3.1067	71.6
24	0.3159	5.1702	1.2005	7.5816	6.2068	81.9
24	0.4557	5.1696	1.8006	10.9368	9.3084	85.1
24	0.6008	5.169	2.4003	14.4192	12.4072	86.0
24	0.7483	5.1684	3.0003	17.9592	15.5068	86.3
24	0.8928	5.1677	3.6001	21.4272	18.6042	86.8
24	1.0395	5.167	4.2	24.9480	21.7014	87.0
24	1.189	5.1663	4.8012	28.5360	24.8044	86.9
24	1.342	5.1655	5.4057	32.2080	27.9231	86.7
24	1.497	5.1647	6.0069	35.9280	31.0238	86.4
Vin (V)	**Iin (A)**	**Vout (V)**	**Iout (A)**	**Pin (W)**	**Pout (W)**	**Efficiency (%)**
60	0.097	5.1712	0.6006	5.8200	3.1058	53.4
60	0.1517	5.1705	1.2003	9.1020	6.2062	68.2
60	0.2076	5.1698	1.8002	12.4560	9.3067	74.7
60	0.2651	5.169	2.4012	15.9060	12.4118	78.0
60	0.3243	5.1683	3.001	19.4580	15.5101	79.7
60	0.3857	5.1677	3.6005	23.1420	18.6063	80.4
60	0.4485	5.1671	4.2	26.9100	21.7018	80.6
60	0.5068	5.1664	4.801	30.4080	24.8039	81.6
60	0.5655	5.1654	5.4042	33.9300	27.9149	82.3
60	0.6246	5.1647	6.0057	37.4760	31.0176	82.8

6 Waveforms

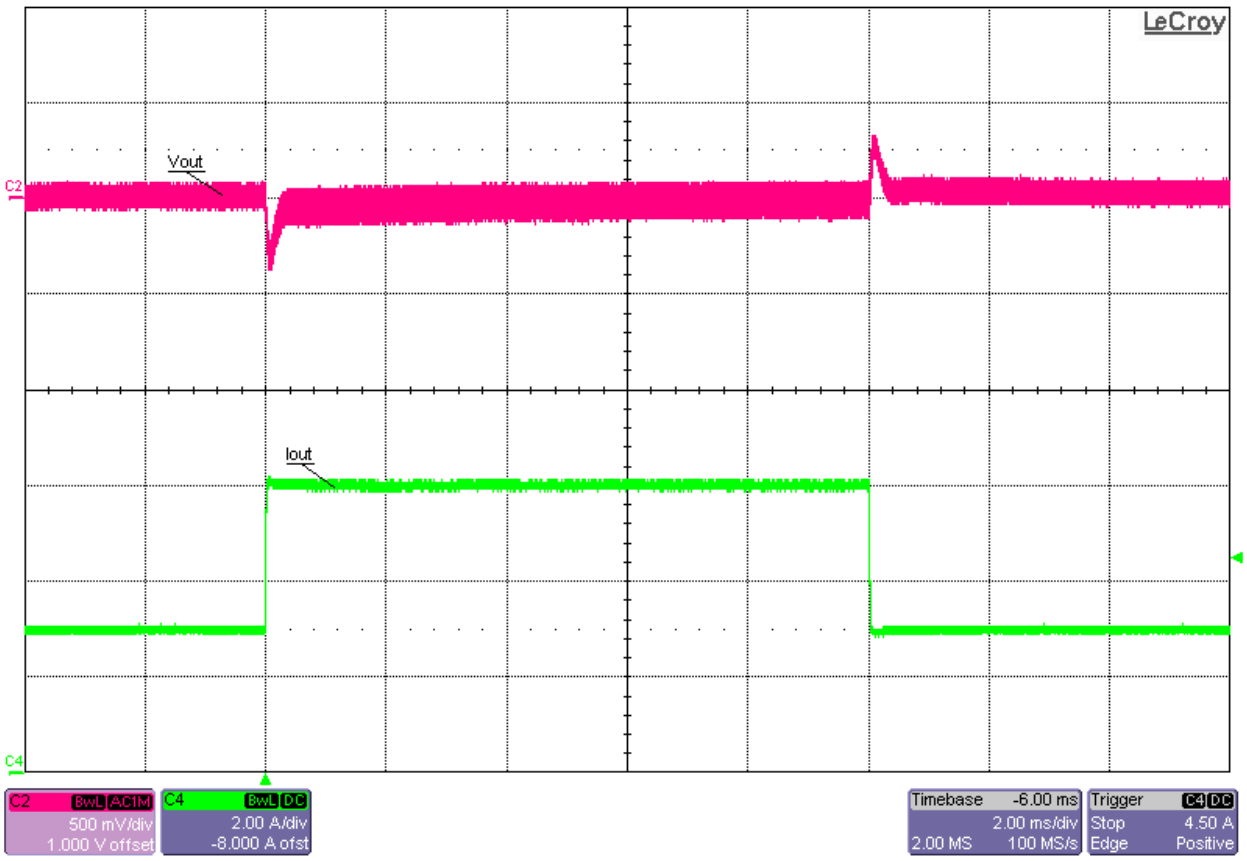
6.1 Load Transient Response



Load Transient Response at 50% to 100% (3A-to-6A) Load Step and Input Voltage at 9Vin

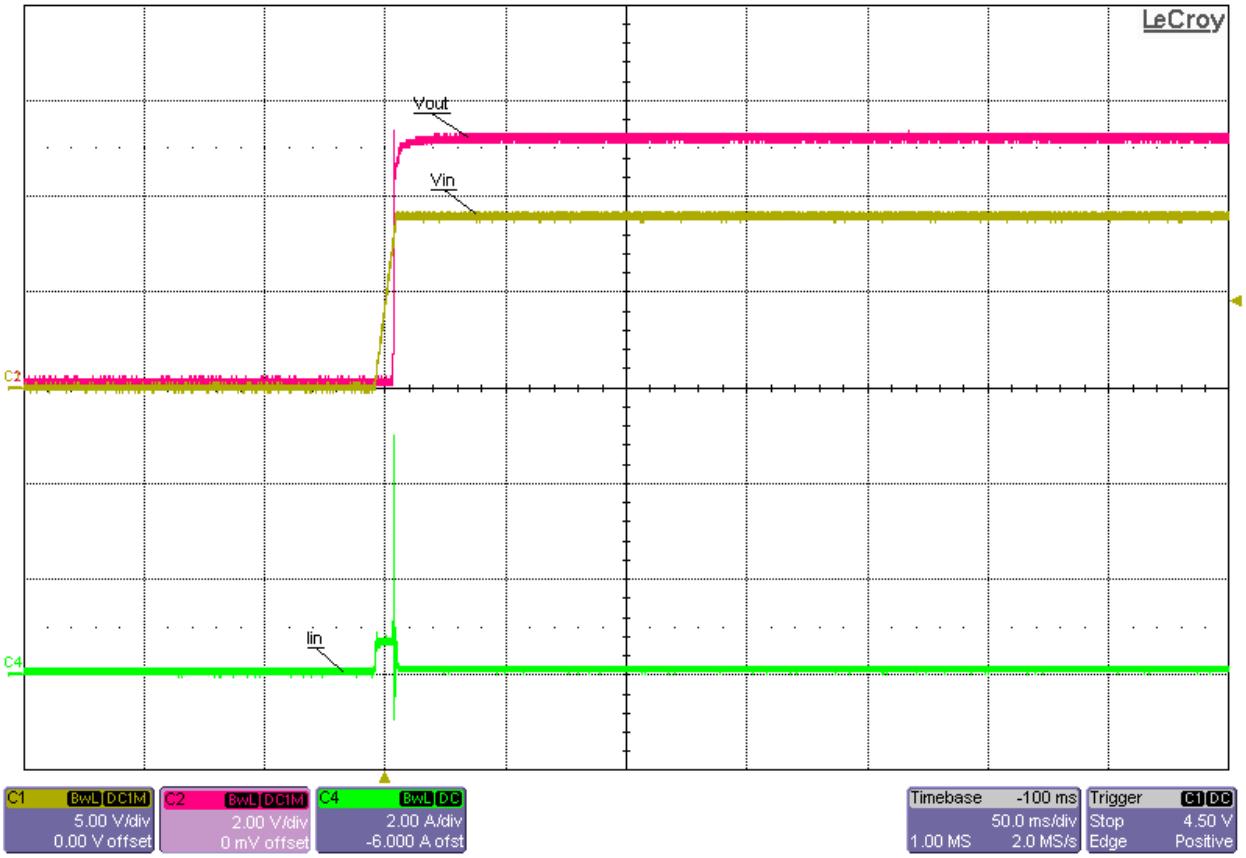


Load Transient Response at 50% to 100% (3A-to-6A) Load Step and Input Voltage at 24Vin

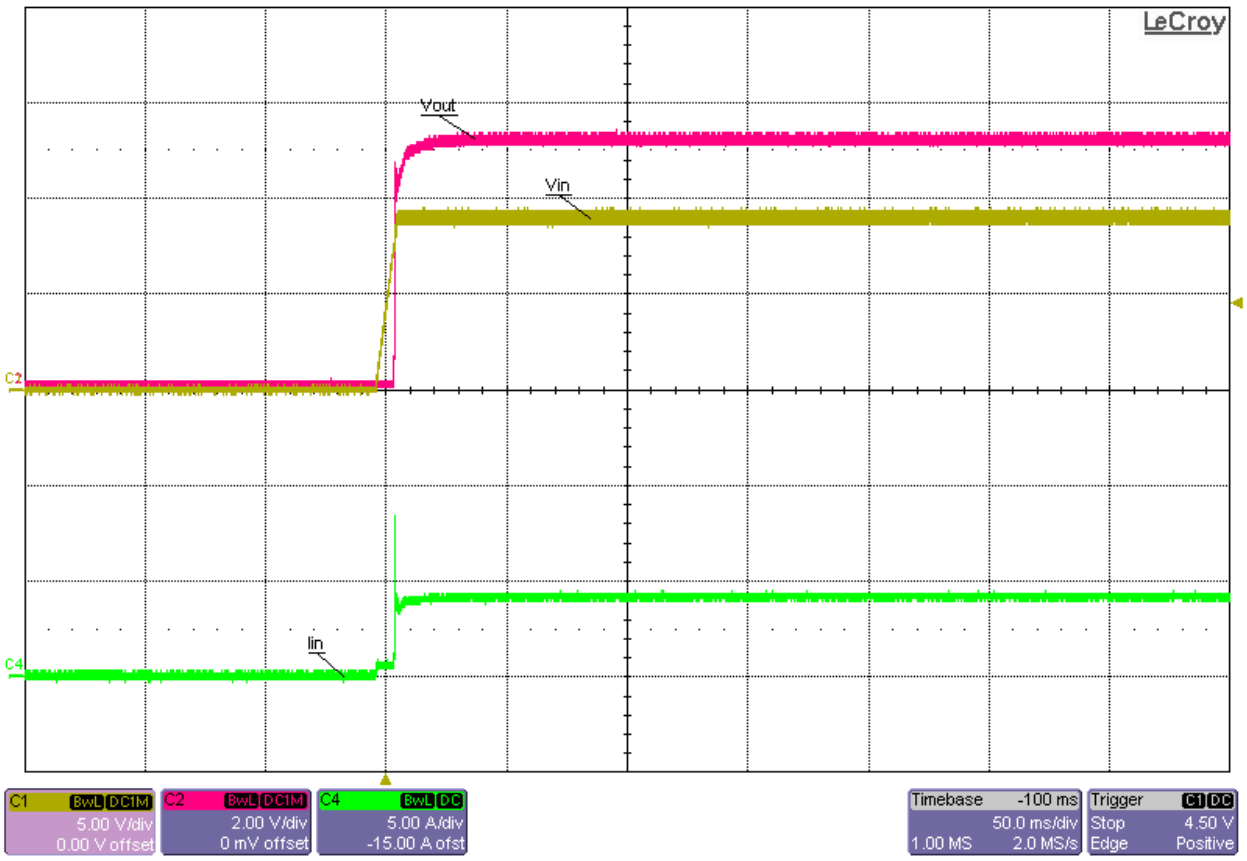


Load Transient Response at 50% to 100% (3A-to-6A) Load Step and Input Voltage at 60Vin

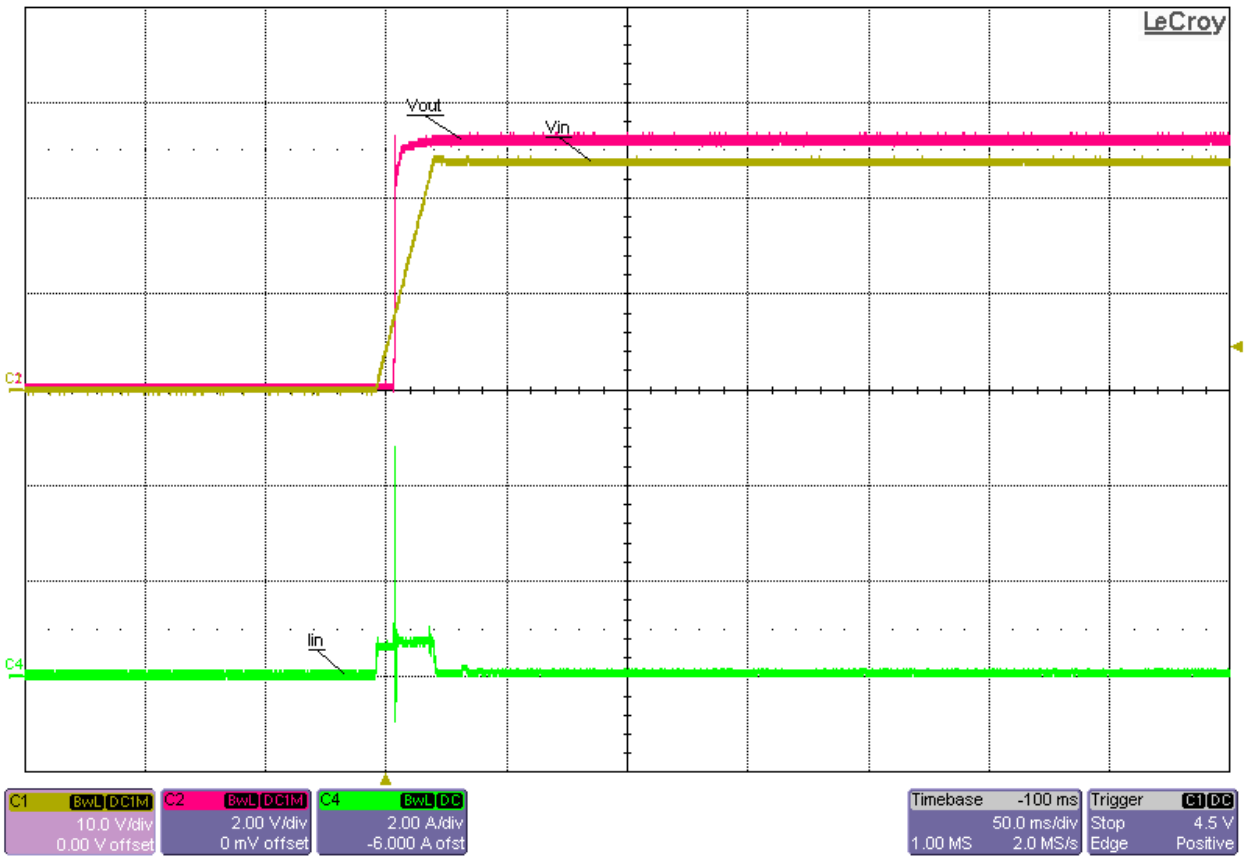
6.2 Startup



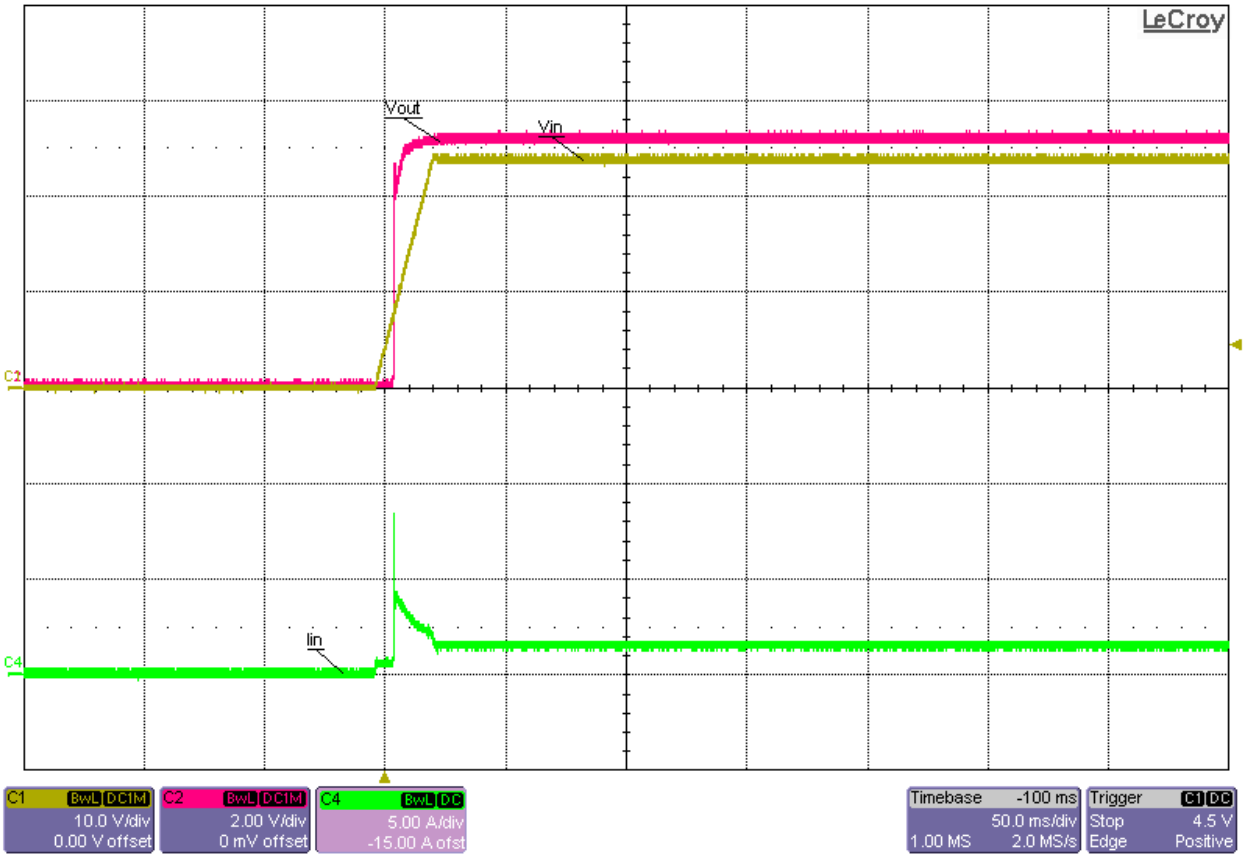
Startup into No Load at 9Vin



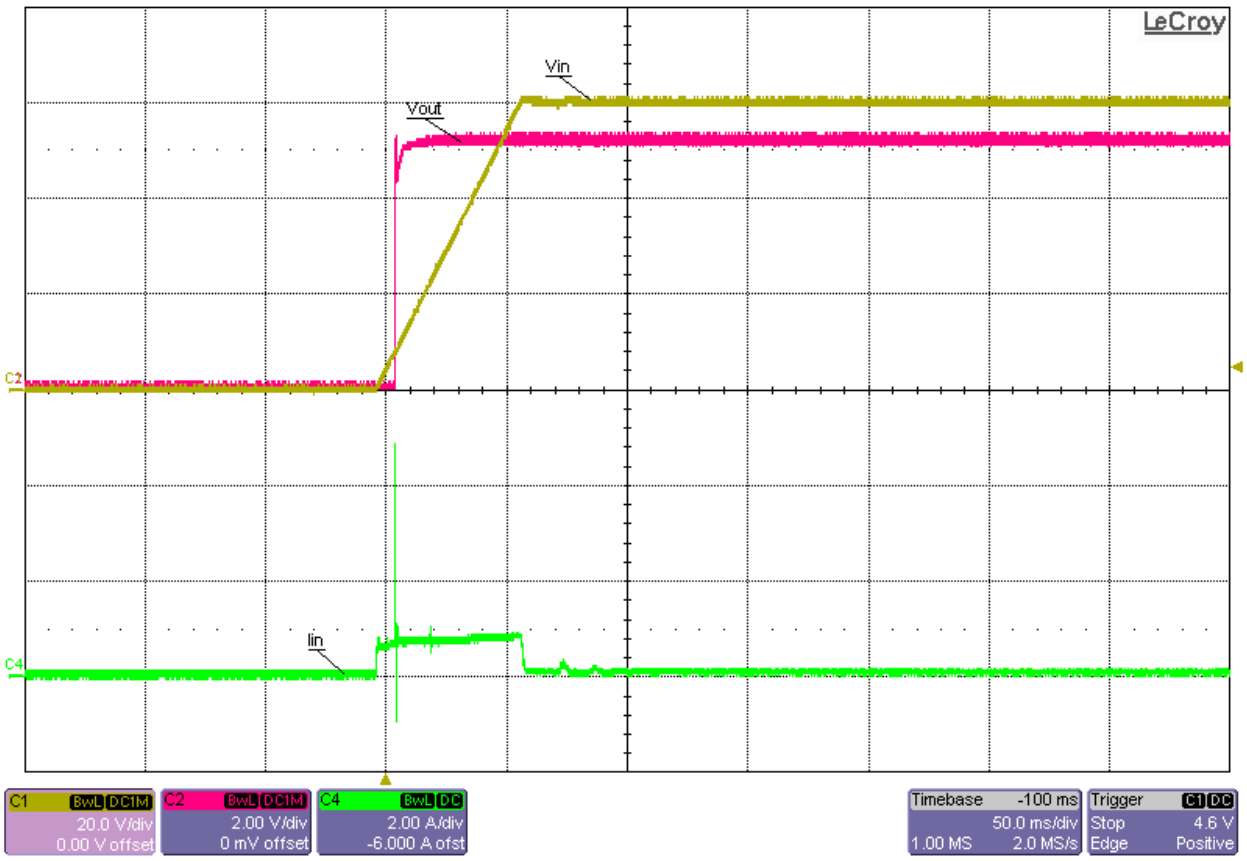
Startup into Full (6A) Load at 9Vin



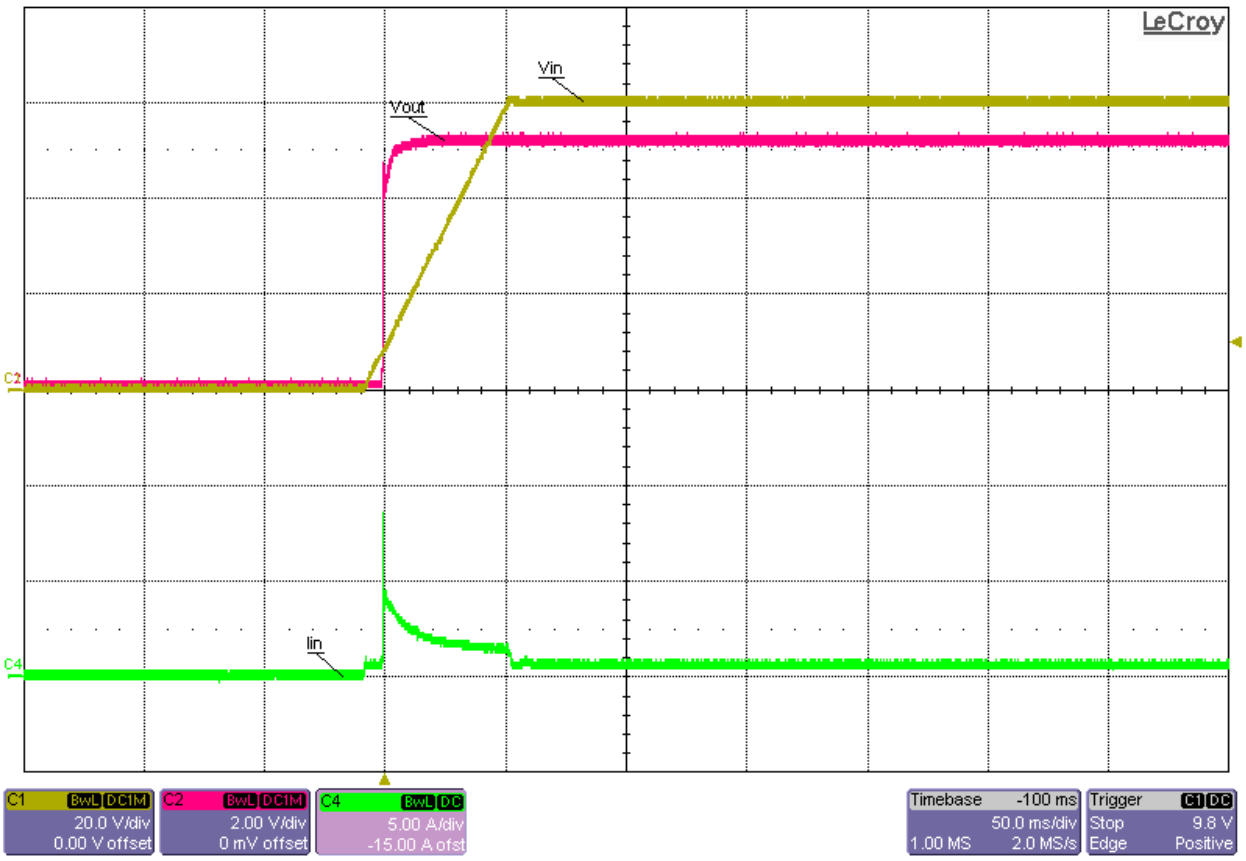
Startup into No Load at 24Vin



Startup into Full (6A) Load at 24Vin

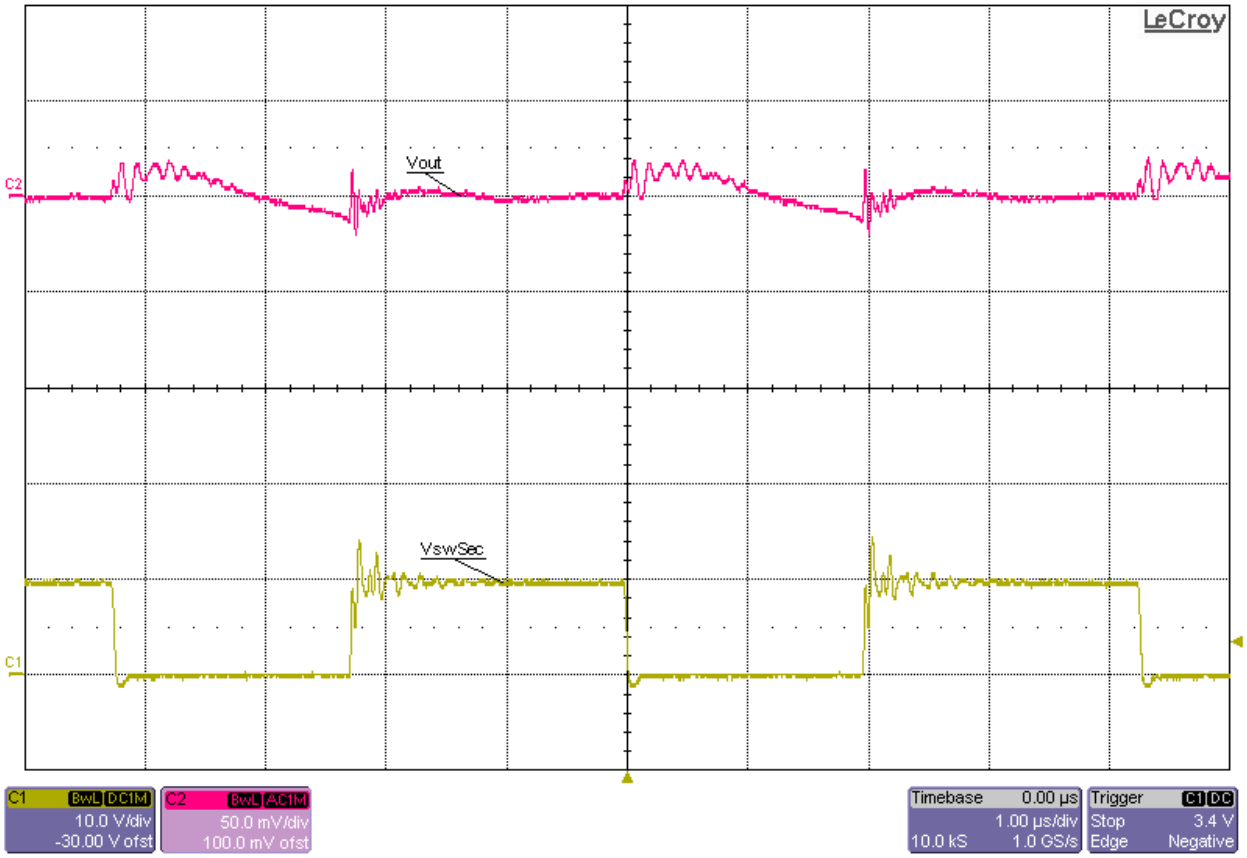


Startup into No Load at 60Vin

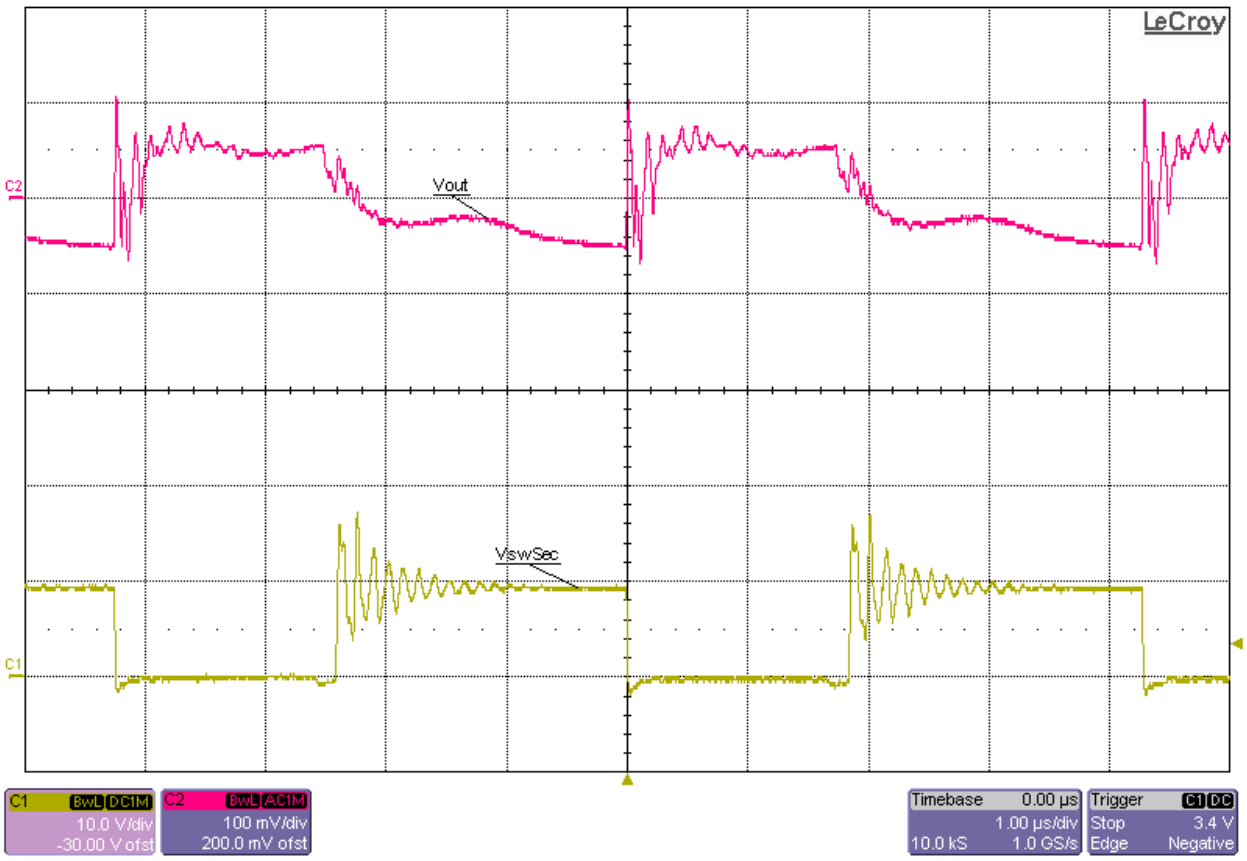


Startup into Full (6A) Load at 60Vin

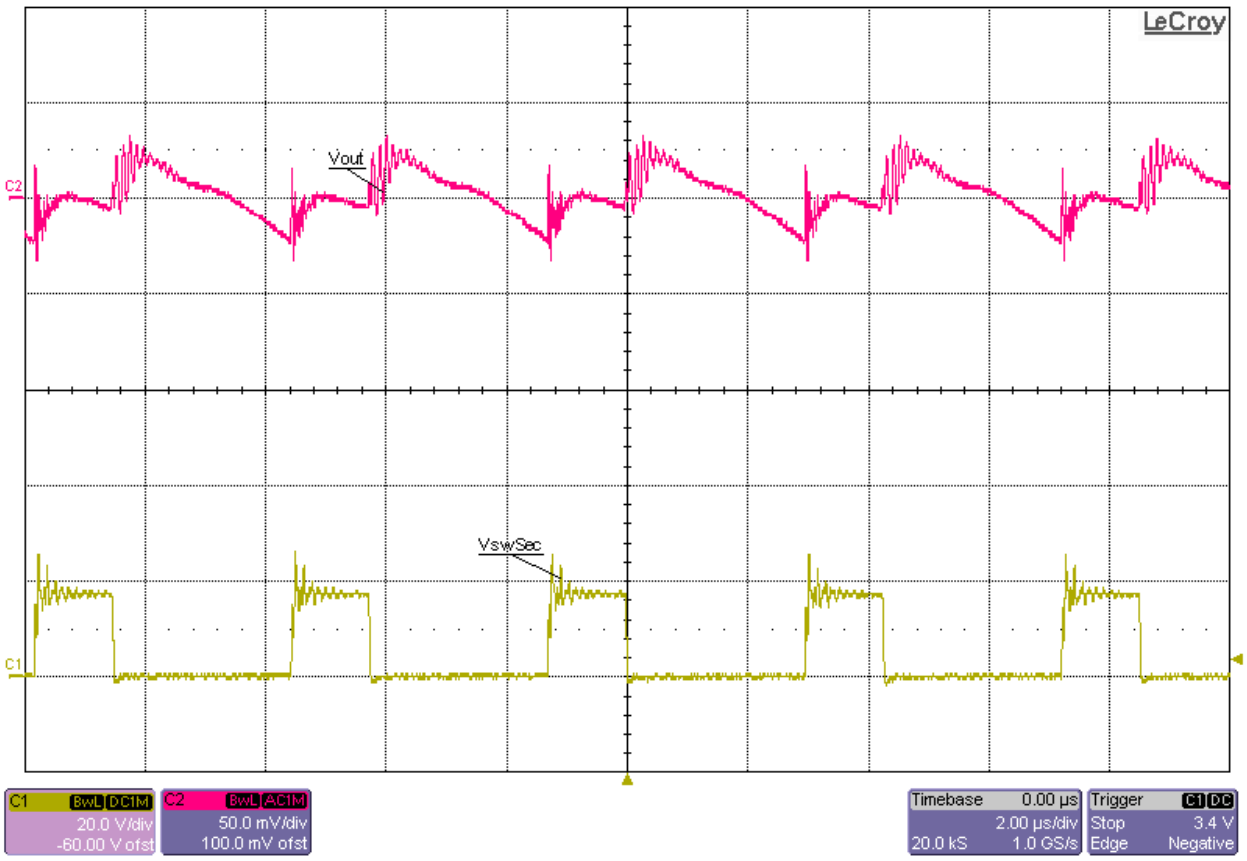
6.3 Output Voltage Ripple and Switch Node Voltage



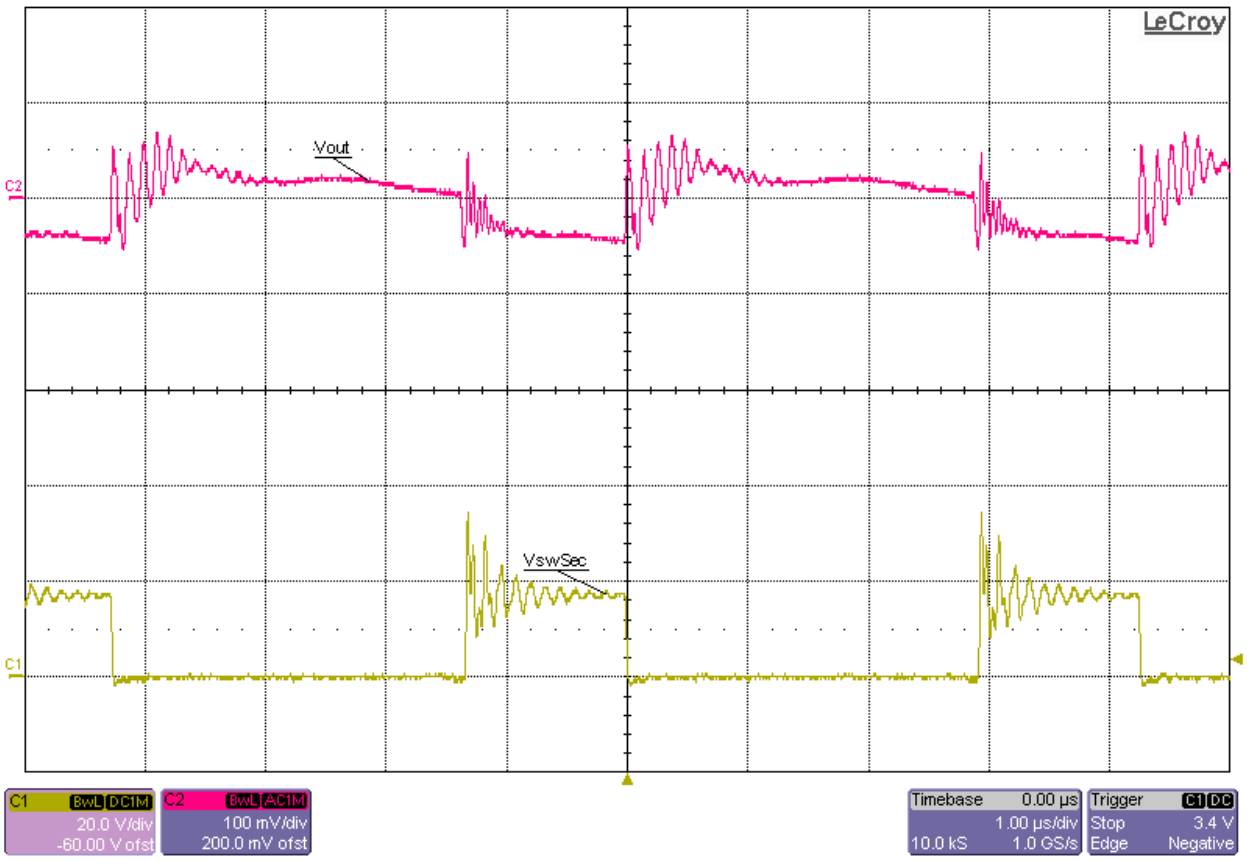
Secondary Switch Node Voltage and Output Voltage Ripple at 9Vin and No Load (Vripple ≈ 30mVp-p)



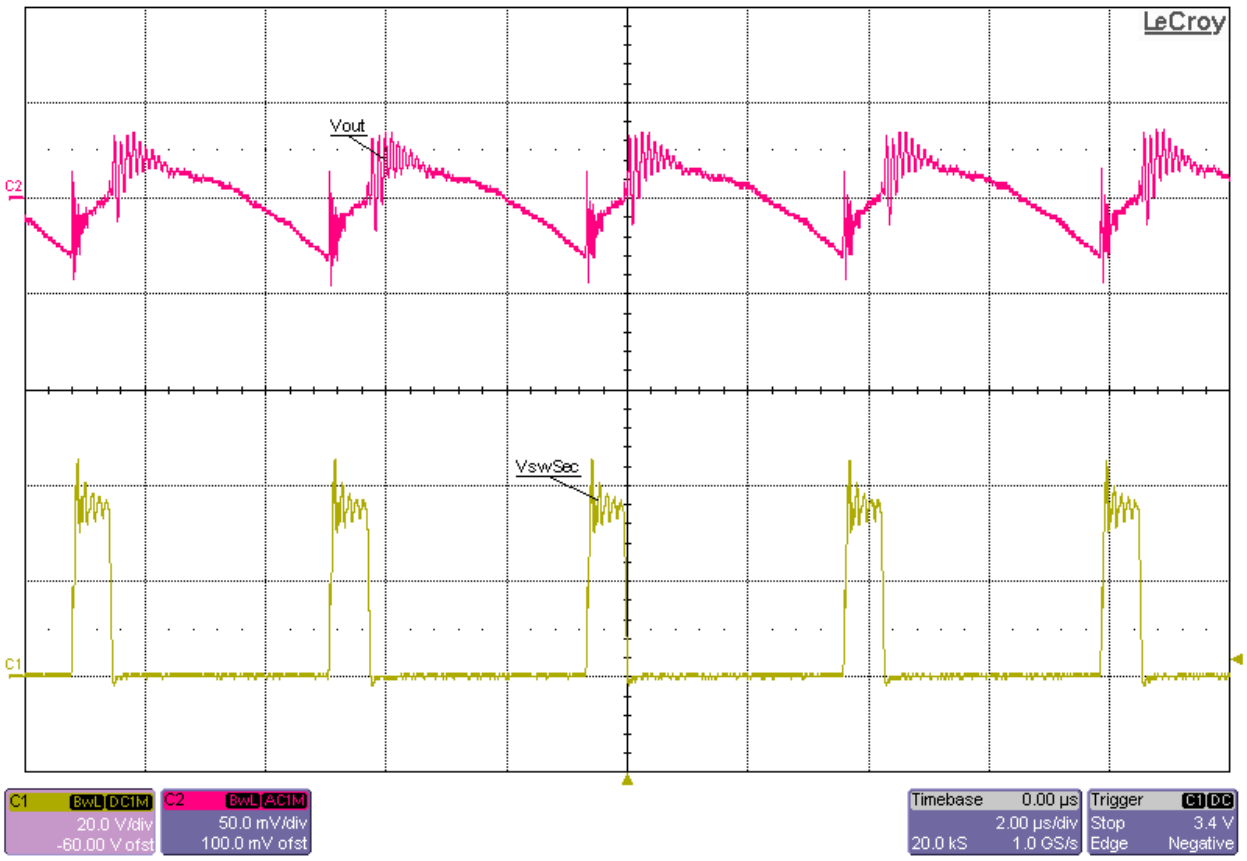
Secondary Switch Node Voltage and Output Voltage Ripple at 9Vin and Full (6A) Load (Vripple ≈ 120mVp-p)



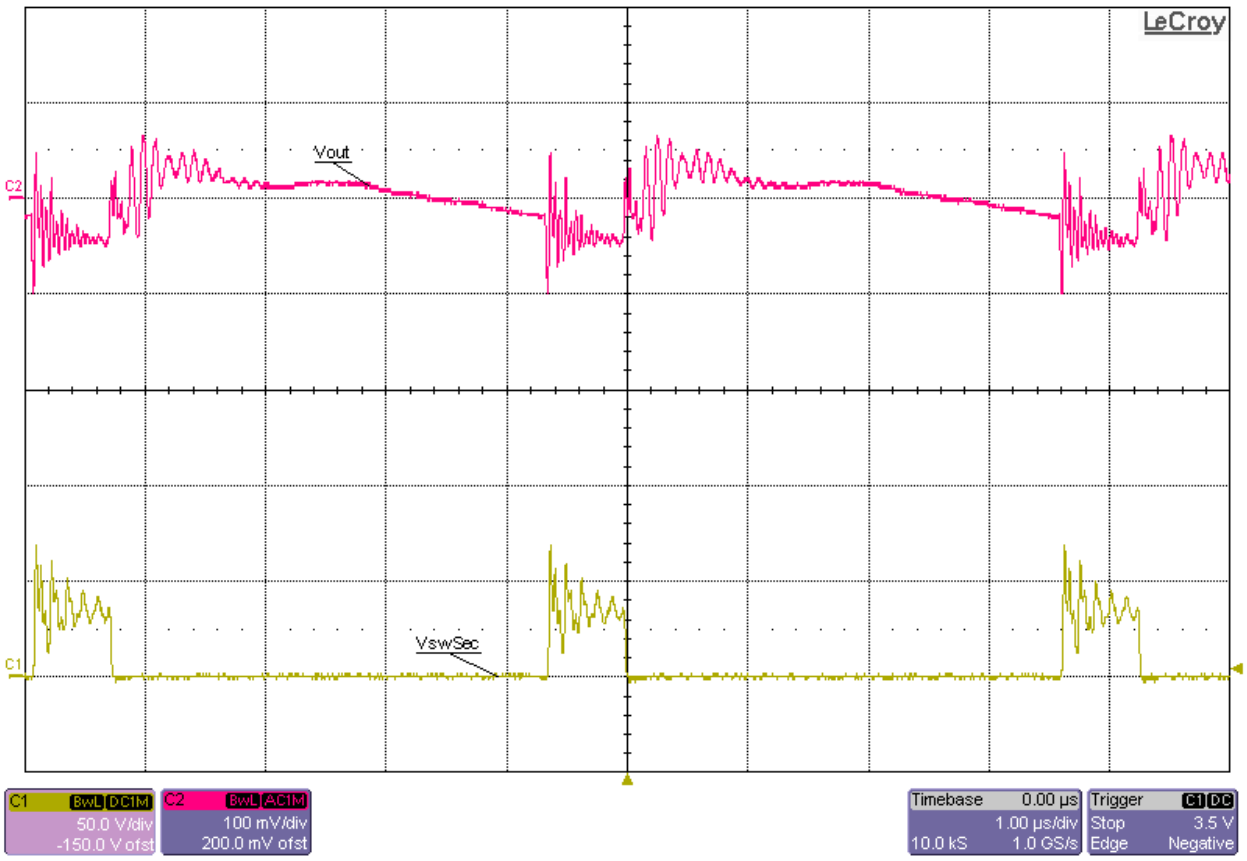
Secondary Switch Node Voltage and Output Voltage Ripple at 24Vin and No Load (Vripple ≈ 50mVp-p)



Secondary Switch Node Voltage and Output Voltage Ripple at 24Vin and Full (6A) Load (Vripple ≈ 100mVp-p)

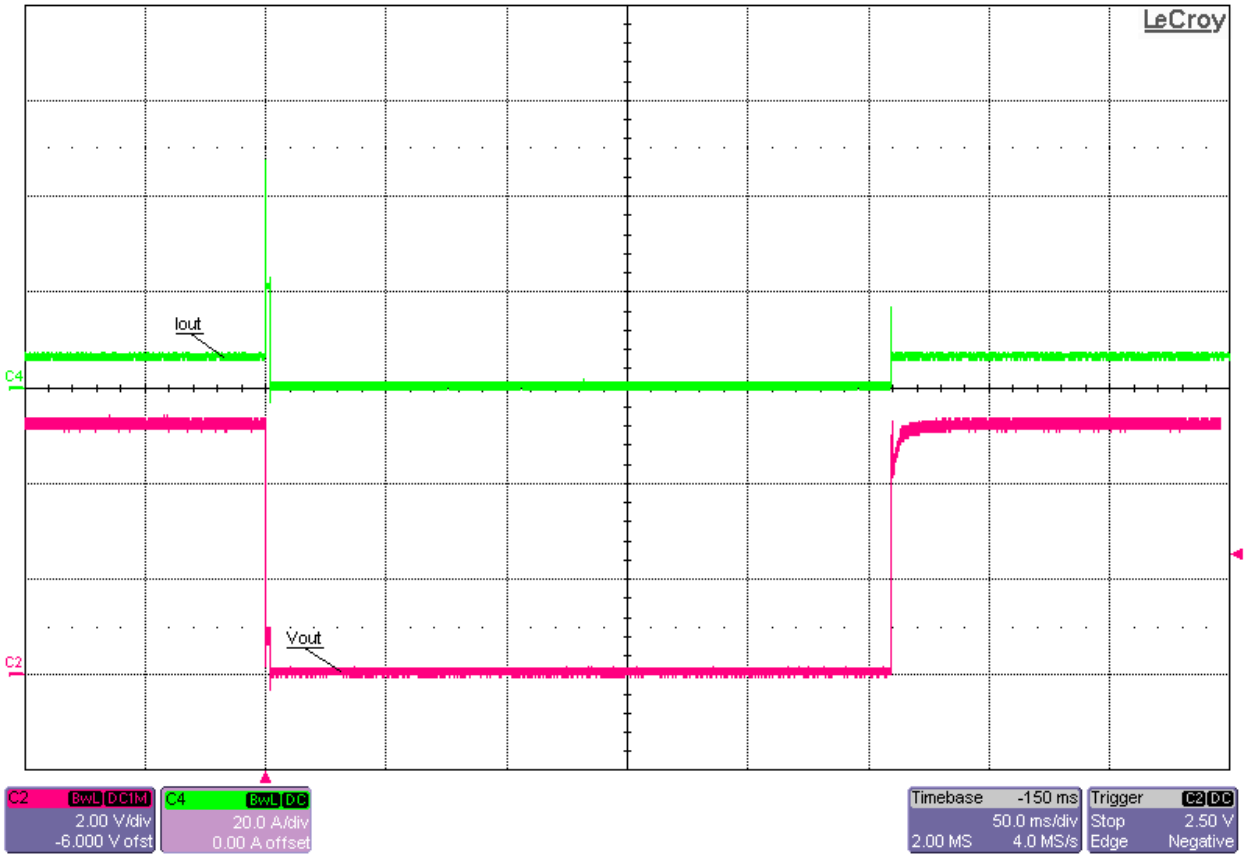


Secondary Switch Node Voltage and Output Voltage Ripple at 60Vin and No Load (Vripple ≈ 60mVp-p)

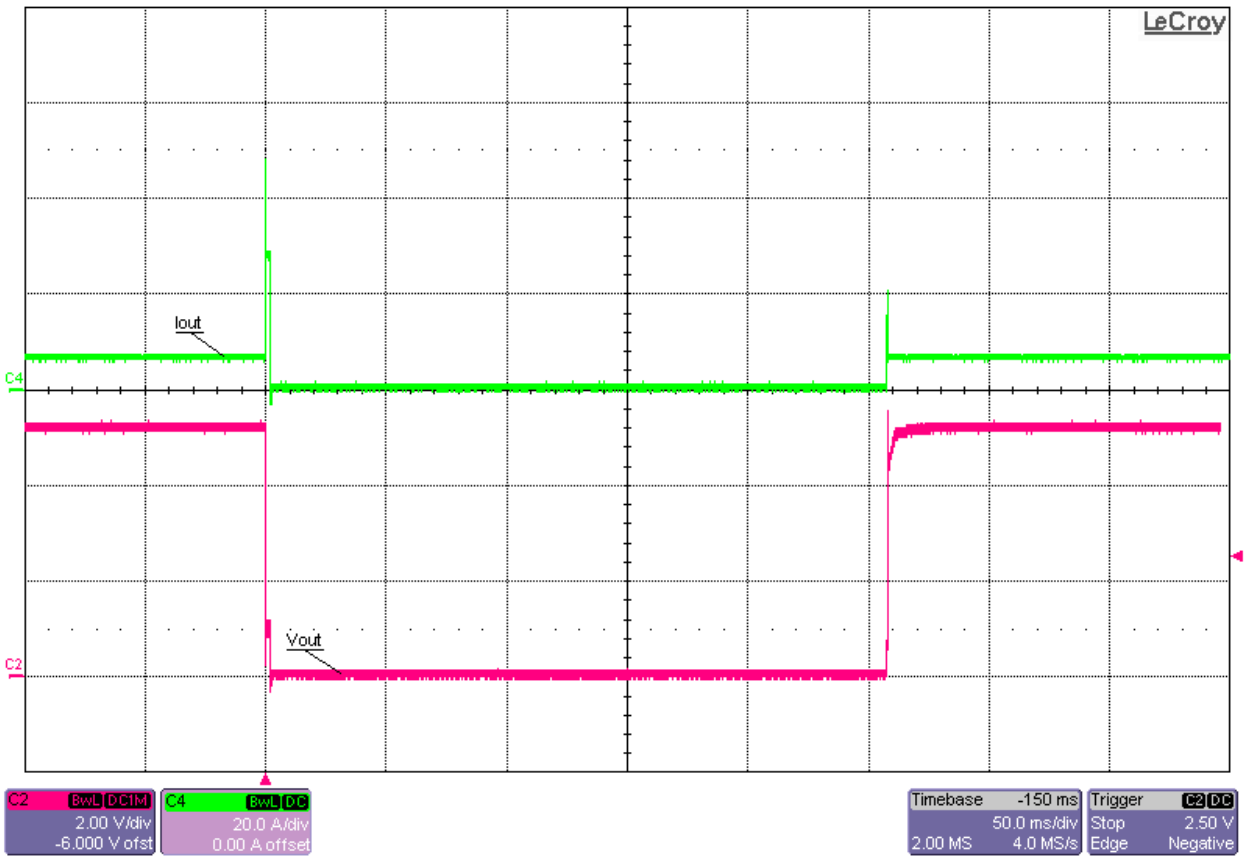


Secondary Switch Node Voltage and Output Voltage Ripple at 60Vin and Full (6A) Load (Vripple ≈ 80mVp-p)

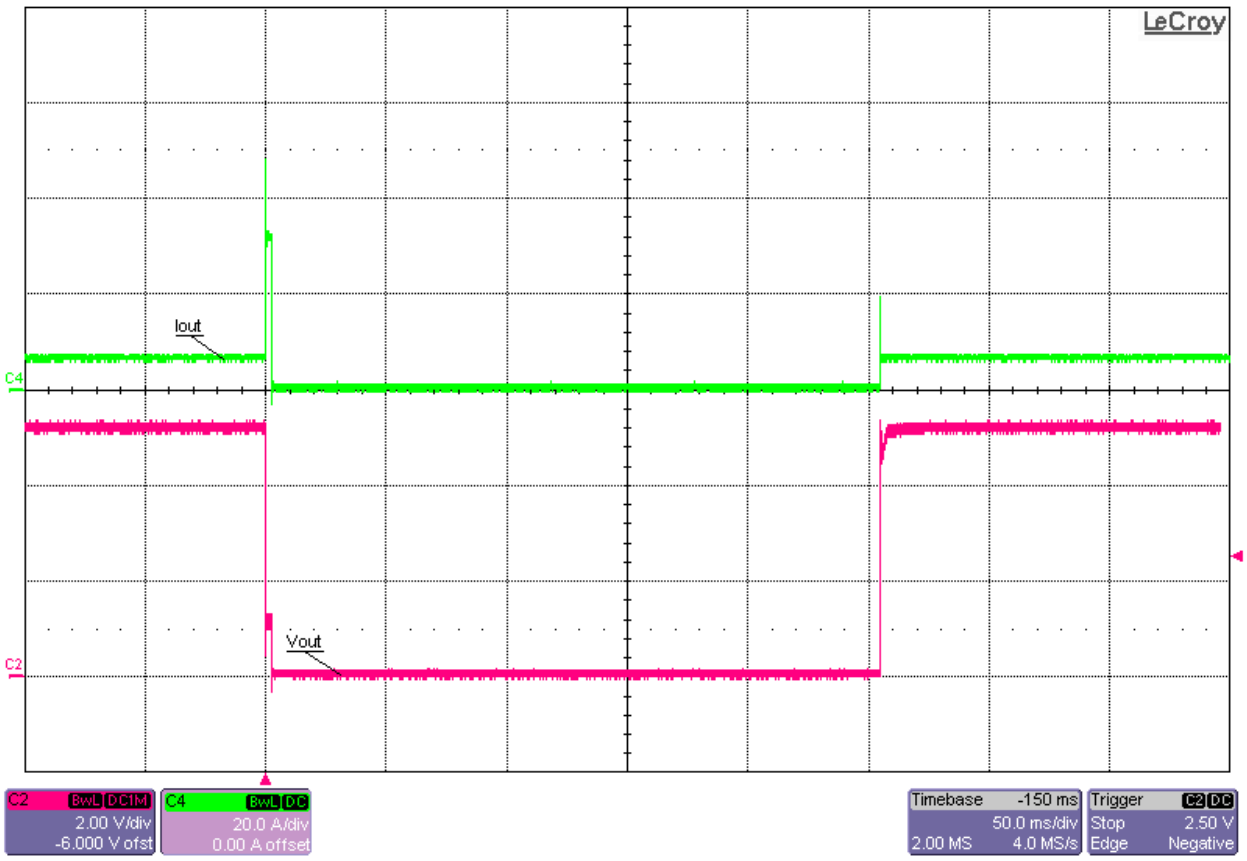
6.4 Short Circuit Testing



Short Circuit Testing with Output at Full (6A) Load and Input Voltage at 9V



Short Circuit Testing with Output at Full (6A) Load and Input Voltage at 24V



Short Circuit Testing with Output at Full (6A) Load and Input Voltage at 60V

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