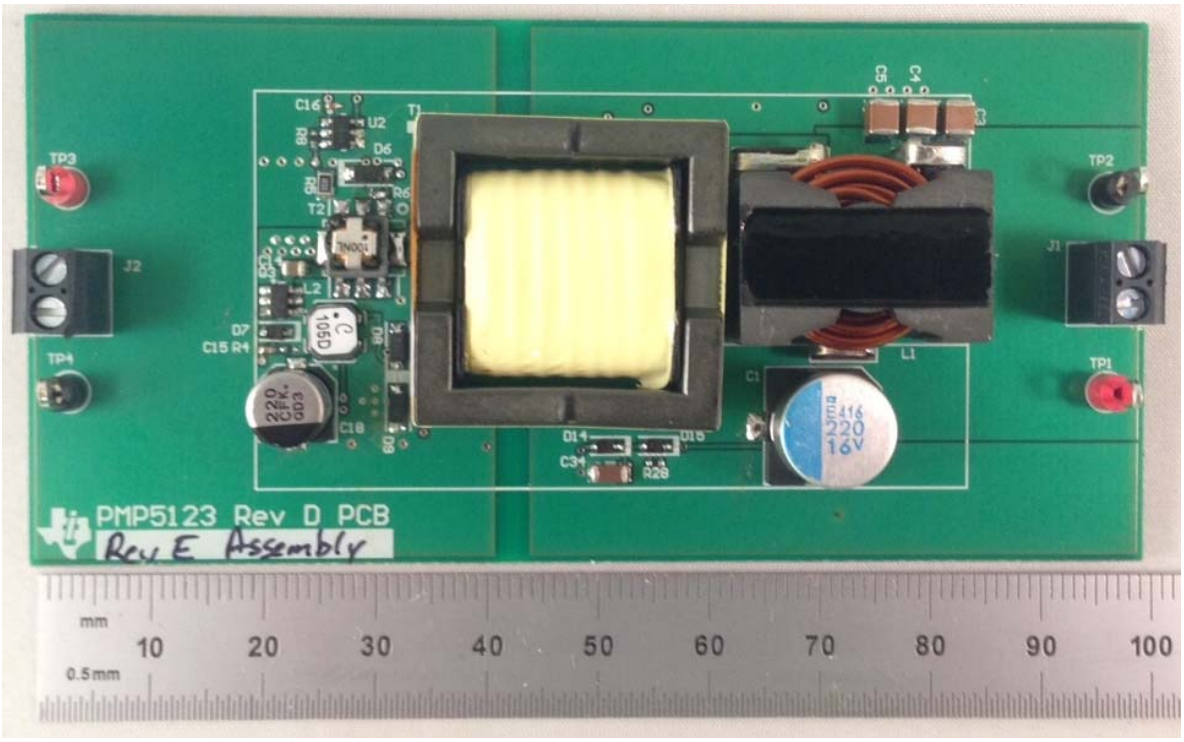
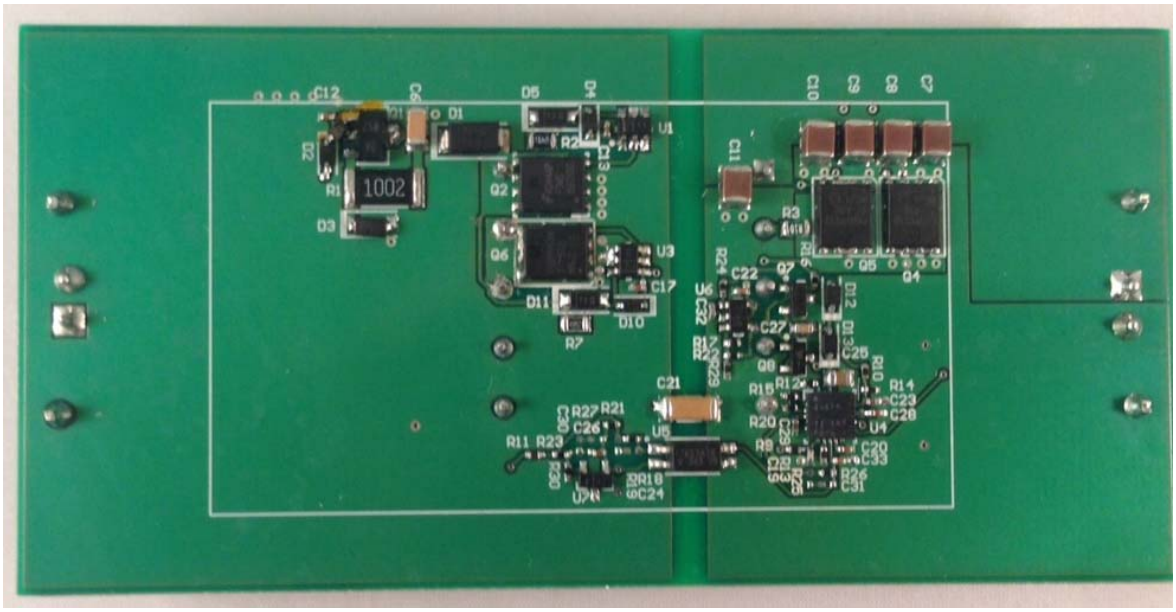
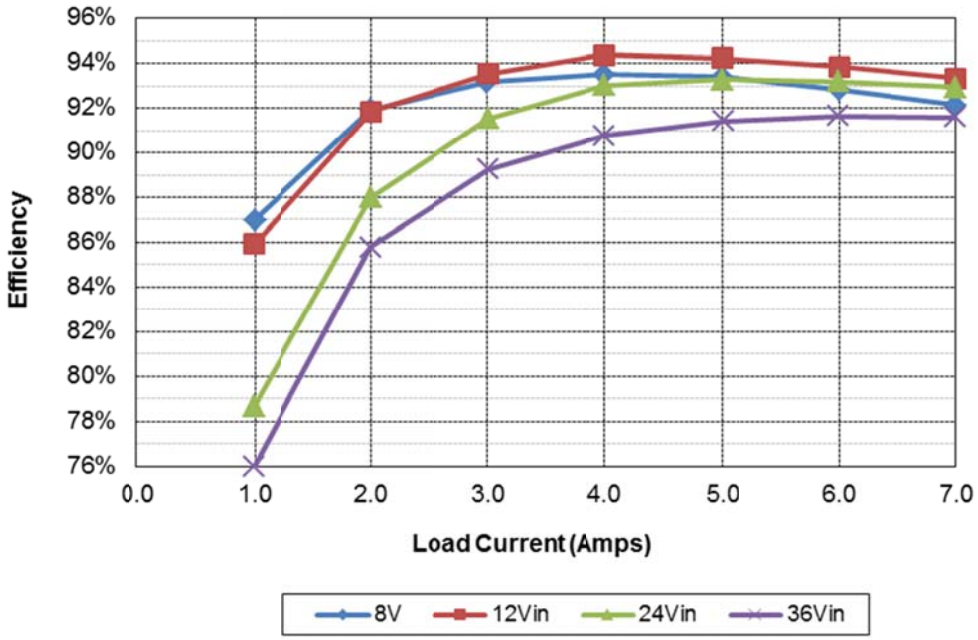
1 Photos

The PMP5123 Rev E Assembly is shown below. This circuit was built using a PMP5123 Rev D PCB.





2 Efficiency



8V

Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.000	12.08	7.97	0.230	1.833	0.00	1.83	
1.001	12.08	7.98	1.742	13.901	12.09	1.81	87.0%
1.999	12.08	8.01	3.279	26.265	24.15	2.12	91.9%
2.999	12.07	8.01	4.85	38.849	36.20	2.65	93.2%
4.002	12.07	8.02	6.44	51.649	48.30	3.34	93.5%
5.002	12.07	8.03	8.05	64.642	60.37	4.27	93.4%
5.999	12.07	8.00	9.75	78.000	72.41	5.59	92.8%
7.00	12.07	7.98	11.49	91.690	84.49	7.20	92.1%

12Vin

Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.000	12.08	12.01	0.170	2.042	0.00	2.04	
0.997	12.08	12.01	1.167	14.016	12.04	1.97	85.9%
2.003	12.08	12.00	2.195	26.340	24.20	2.14	91.9%
3.001	12.08	12.03	3.222	38.761	36.25	2.51	93.5%
3.999	12.08	11.99	4.27	51.197	48.31	2.89	94.4%
5.002	12.07	12.02	5.33	64.067	60.37	3.69	94.2%
6.001	12.07	12.02	6.42	77.168	72.43	4.74	93.9%
7.00	12.07	12.02	7.53	90.511	84.49	6.02	93.3%

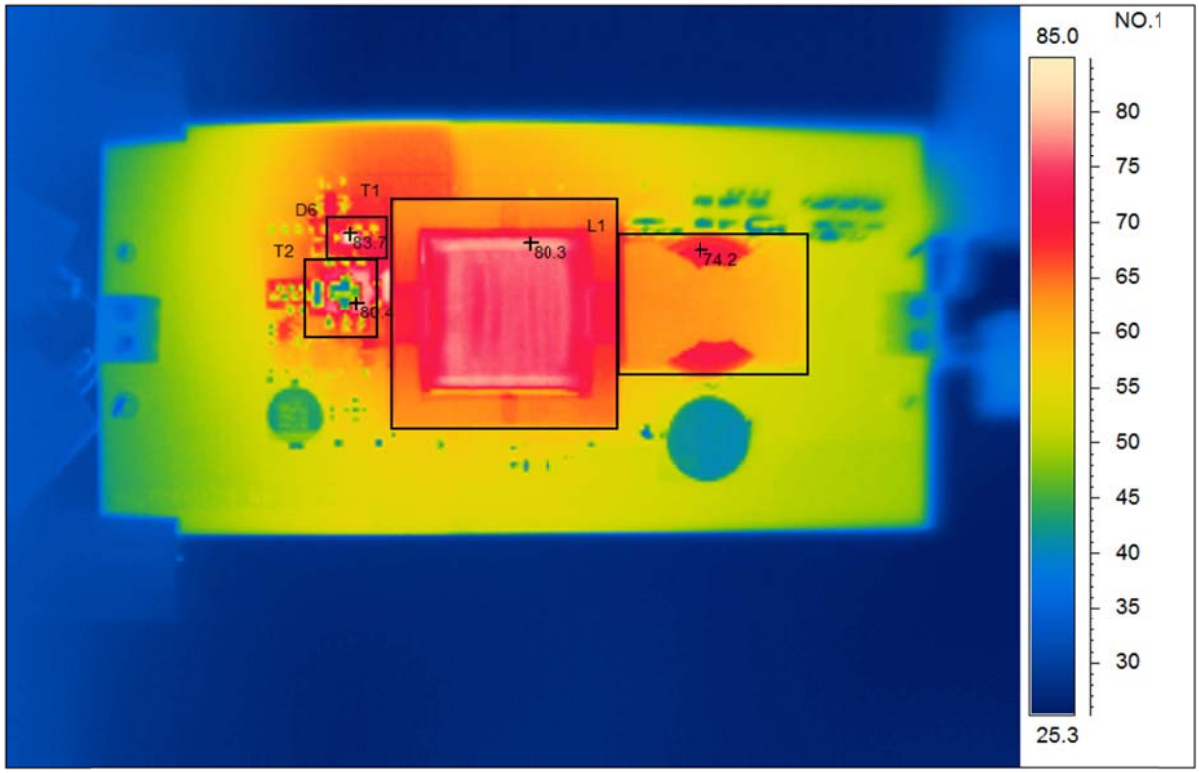
24Vin							
Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.000	12.09	24.00	0.148	3.552	0.00	3.55	
0.998	12.09	24.00	0.639	15.336	12.07	3.27	78.7%
1.999	12.09	23.99	1.145	27.469	24.17	3.30	88.0%
3.001	12.09	24.02	1.650	39.633	36.28	3.35	91.5%
4.001	12.09	24.02	2.165	52.003	48.37	3.63	93.0%
4.999	12.08	24.01	2.696	64.731	60.39	4.34	93.3%
5.998	12.08	24.01	3.238	77.744	72.46	5.29	93.2%
7.00	12.09	24.00	3.794	91.056	84.63	6.43	92.9%

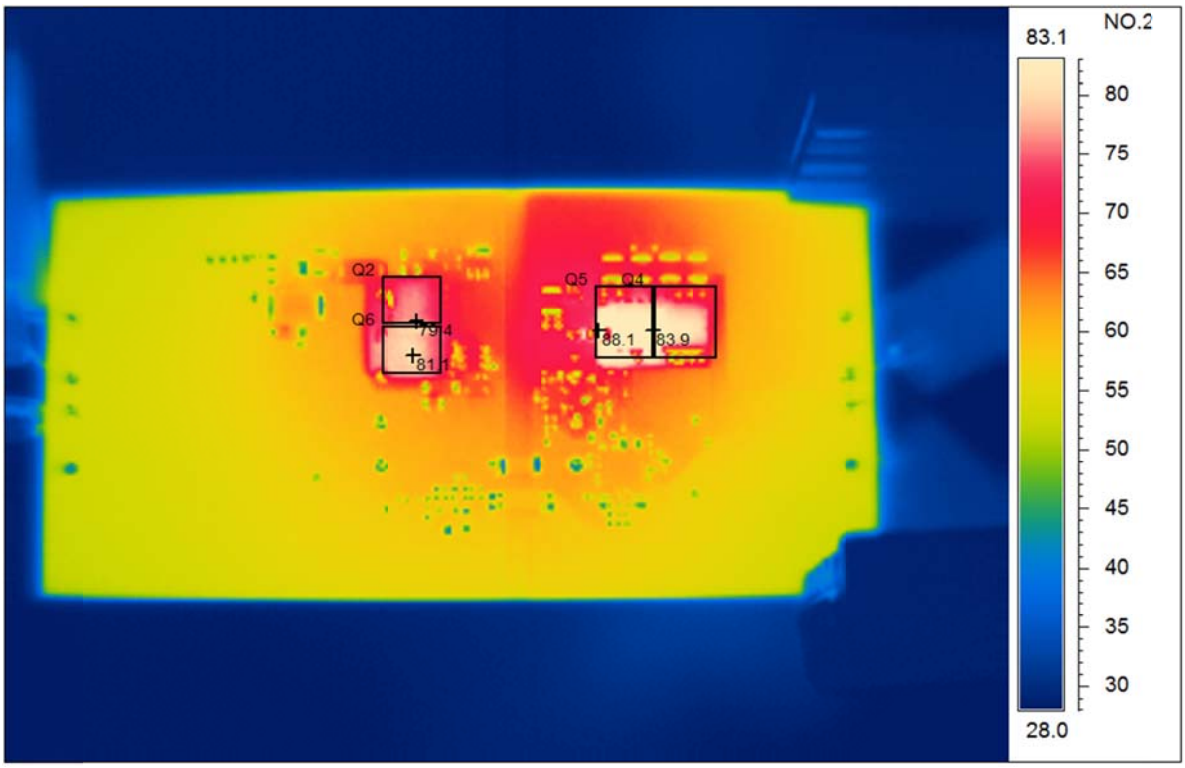
36Vin							
Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.000	12.10	36.01	0.106	3.817	0.00	3.82	
0.997	12.10	35.99	0.441	15.872	12.06	3.81	76.0%
1.999	12.10	36.01	0.783	28.196	24.19	4.01	85.8%
3.002	12.09	35.99	1.130	40.669	36.29	4.37	89.2%
4.003	12.09	36.00	1.481	53.316	48.40	4.92	90.8%
5.004	12.09	36.02	1.837	66.169	60.50	5.67	91.4%
5.998	12.09	36.00	2.198	79.128	72.52	6.61	91.6%
7.00	12.10	36.02	2.567	92.463	84.70	7.76	91.6%

3 Thermal

The thermal images below show the circuit board with a 7A load. The ambient temperature was 25C with no air flow.

3.1 12V Input





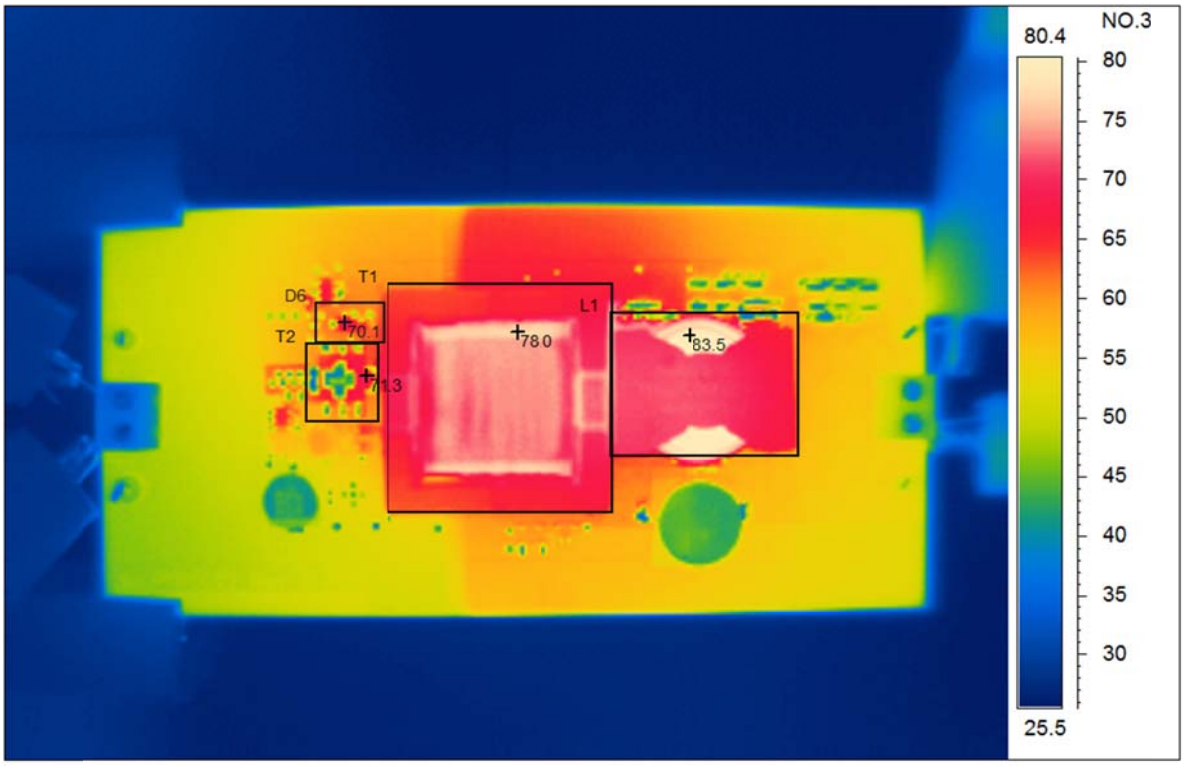
NO.1

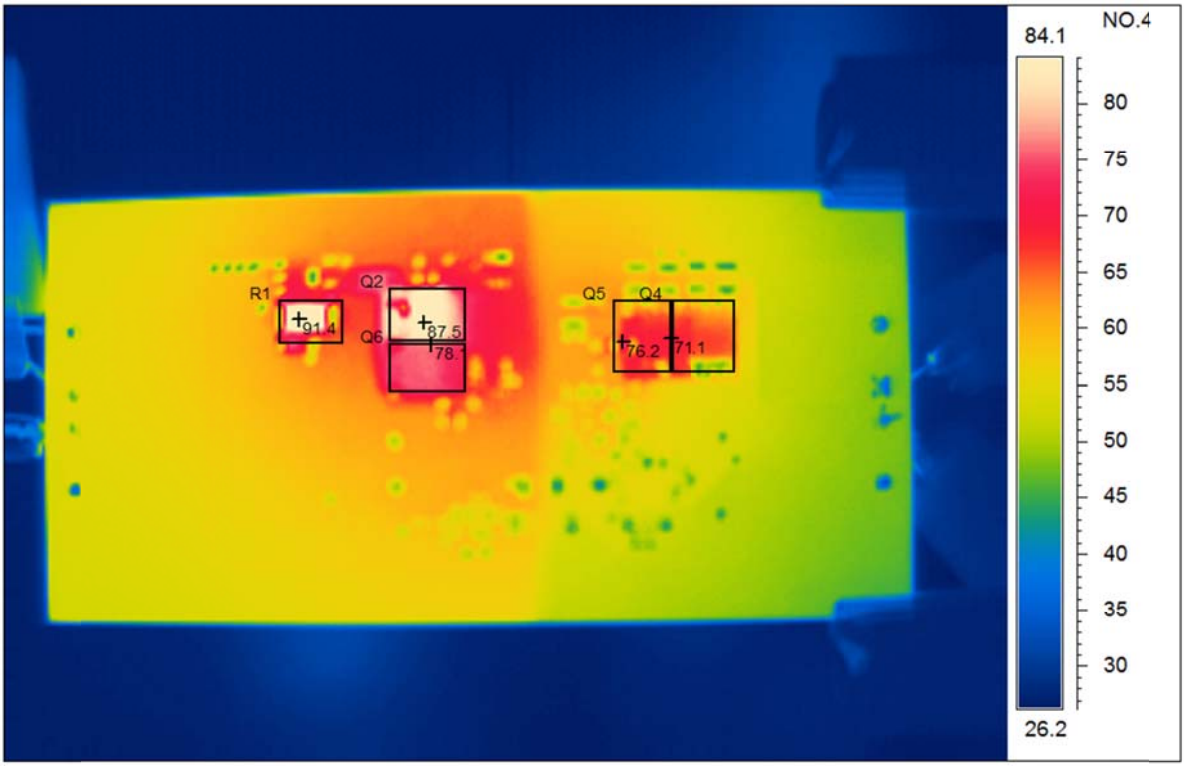
Area analysis	Value
T1 Max	80.3°C
L1Max	74.2°C
T2Max	80.4°C
D6 Max	83.7°C

NO.2

Area analysis	Value
Q5Max	88.1°C
Q4Max	83.9°C
Q6Max	81.1°C
Q2 Max	79.4°C

3.2 24V Input


NO.3
80.4
25.5
80
75
70
65
60
55
50
45
40
35
30
T1
D6
T2
L1
70.1
78.0
83.5
71.3


NO.4
84.1
26.2
80
75
70
65
60
55
50
45
40
35
30
R1
Q2
Q6
Q5
Q4
91.4
87.5
78.1
76.2
71.1

NO.3

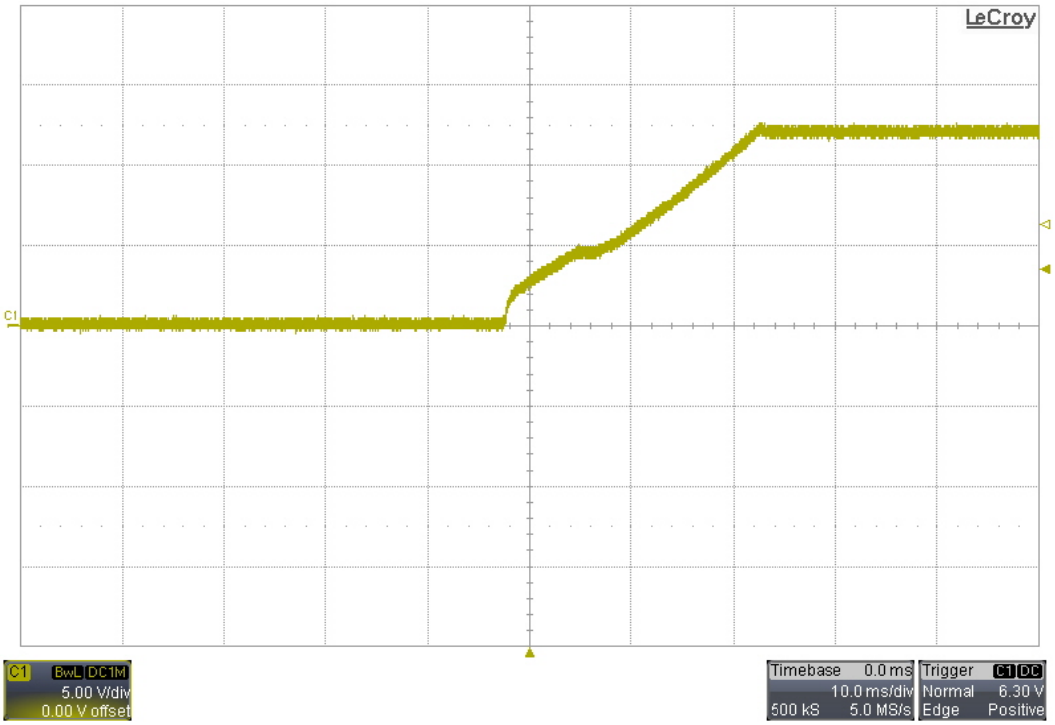
Area analysis	Value
T1 Max	78.0°C
L1Max	83.5°C
T2Max	71.3°C
D6 Max	70.1°C

NO.4

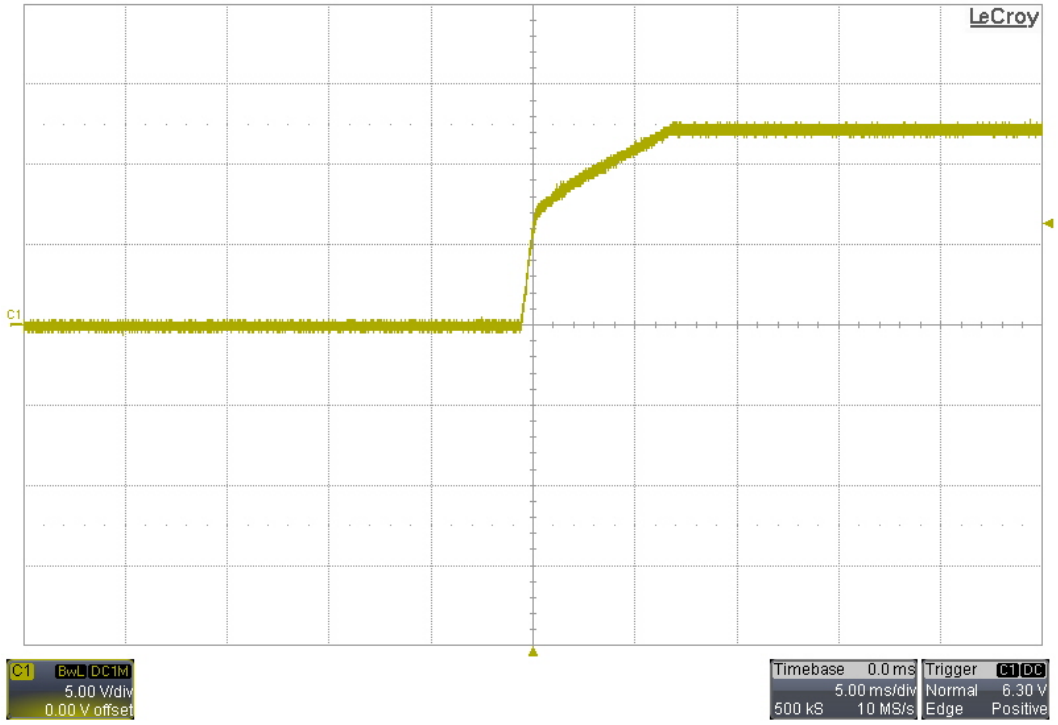
Area analysis	Value
Q5Max	76.2°C
Q4Max	71.1°C
Q6Max	78.1°C
Q2 Max	87.5°C
R1 Max	91.4°C

4 Startup

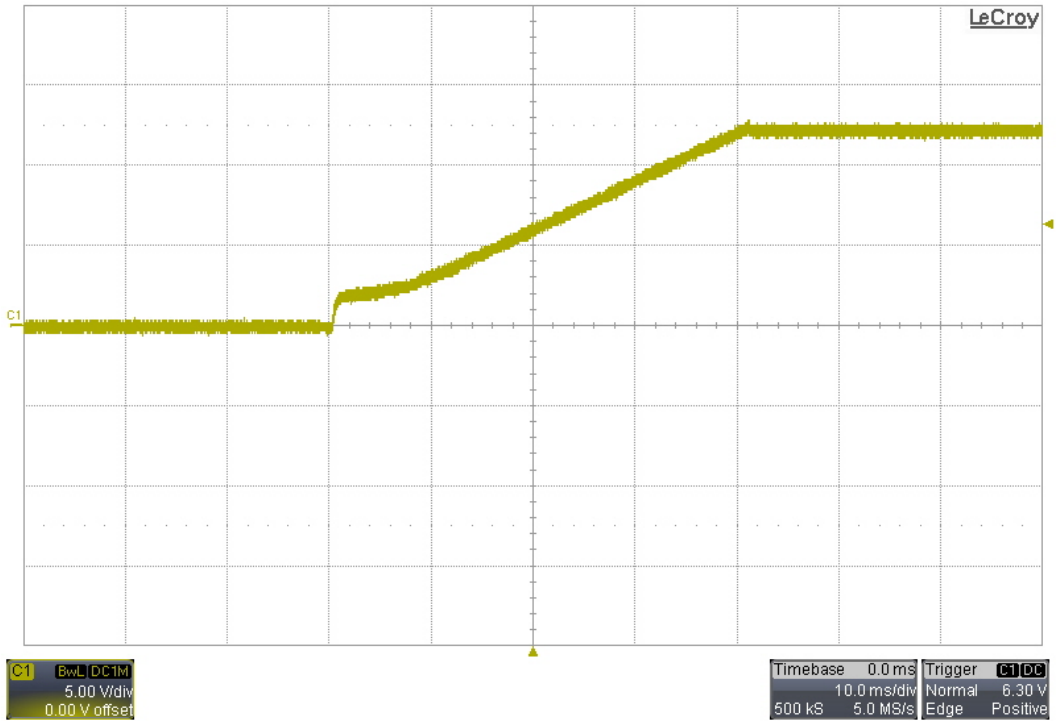
4.1 8V Input, No Load



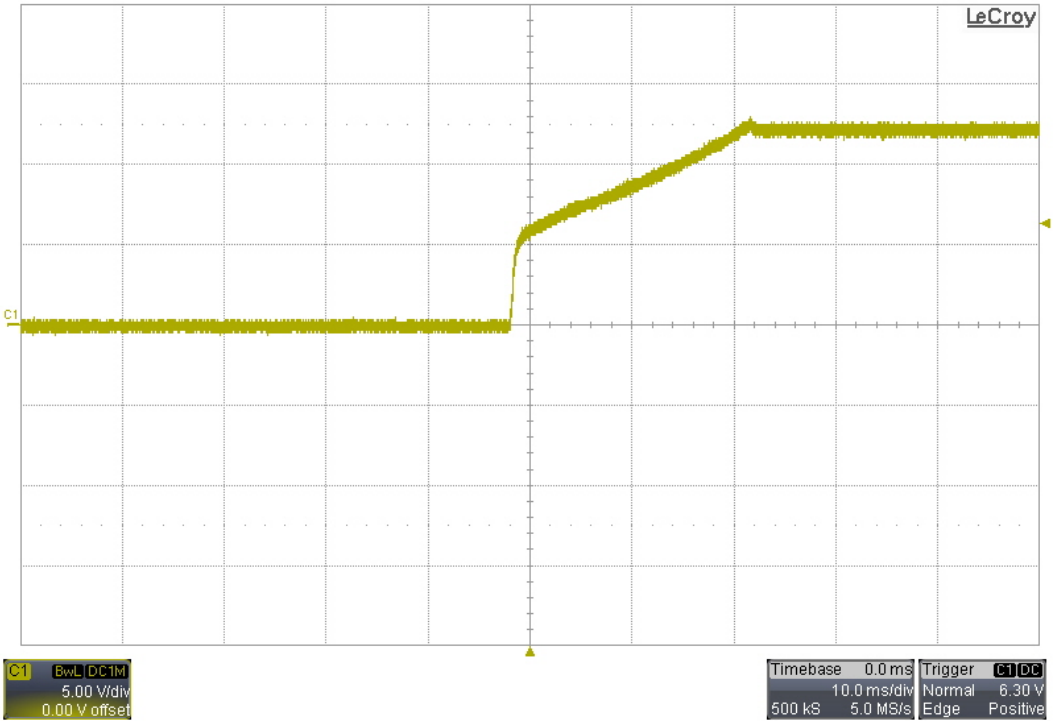
4.2 36V Input, No Load



4.3 8V Input, 2Ω Load

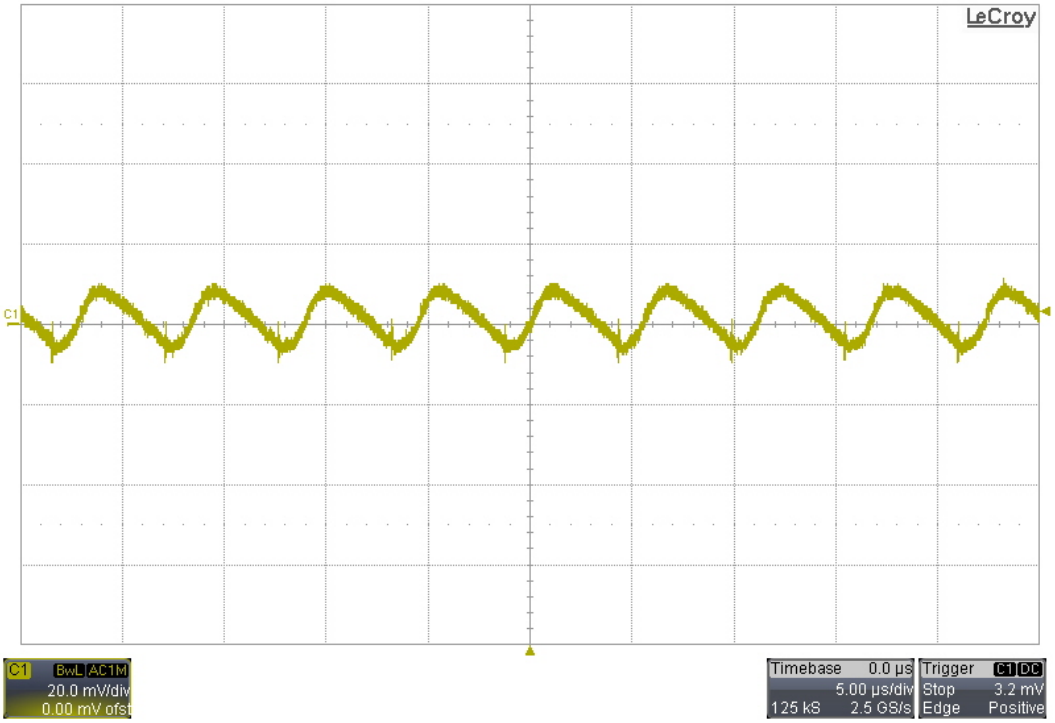


4.4 36V Input, 2Ω Load

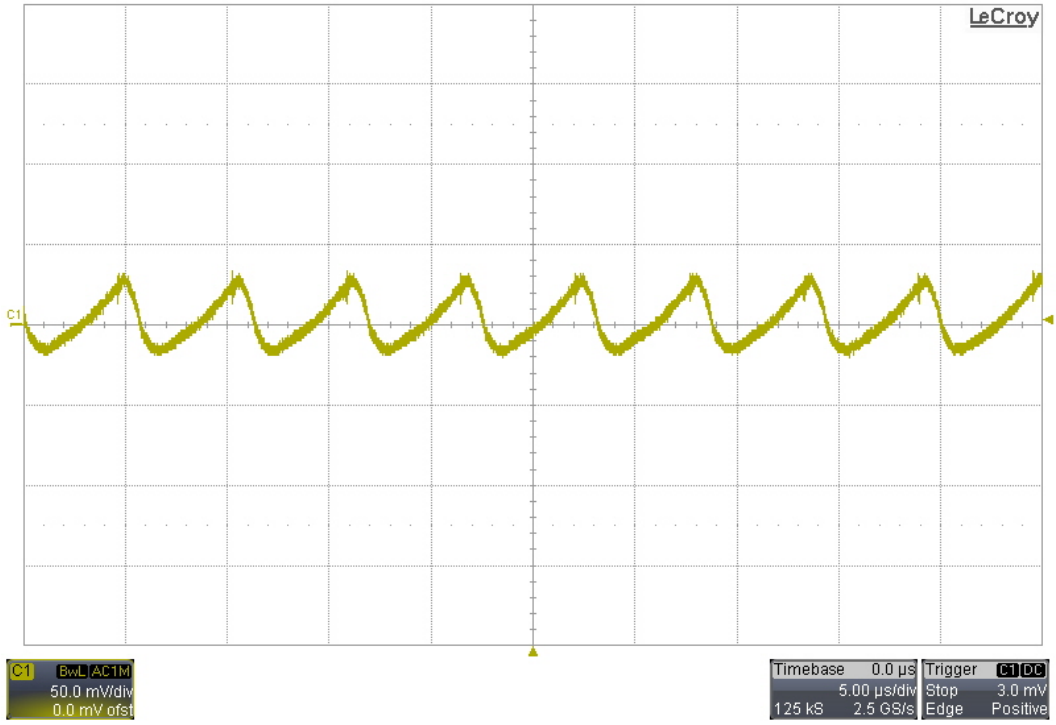


5 Output Ripple Voltage

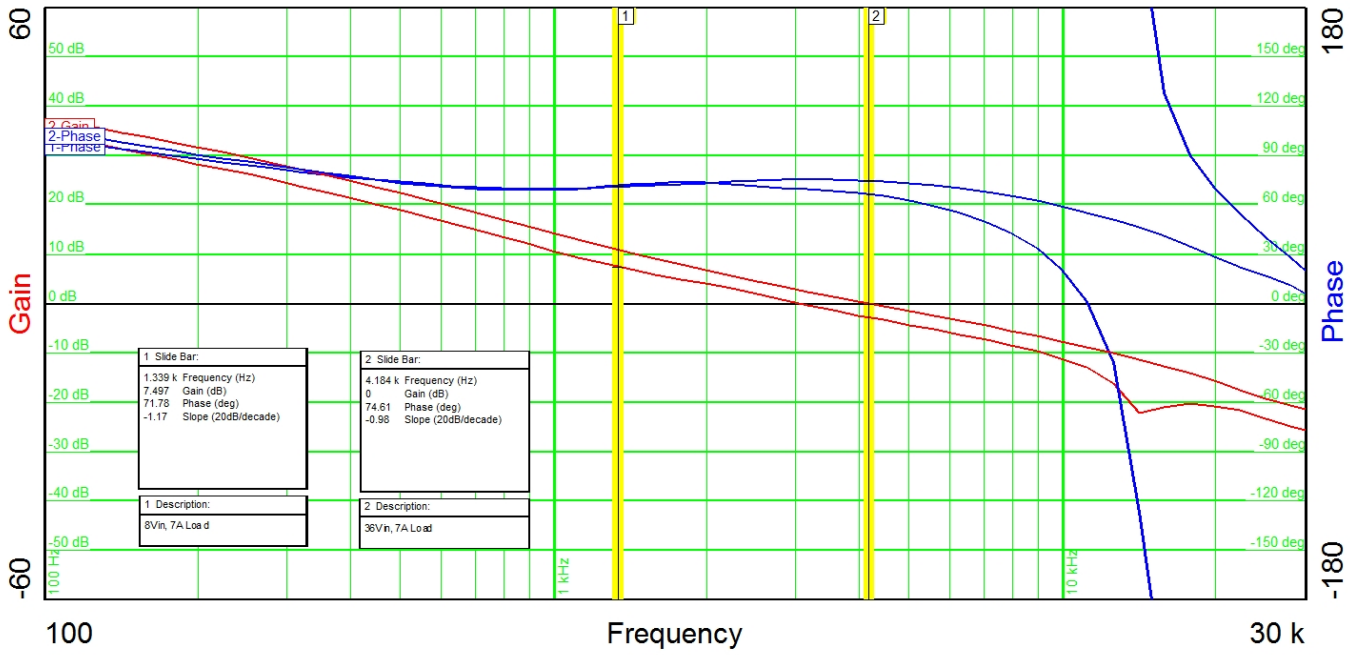
5.1 8V Input, 7A Load



5.2 36V Input, 7A Load

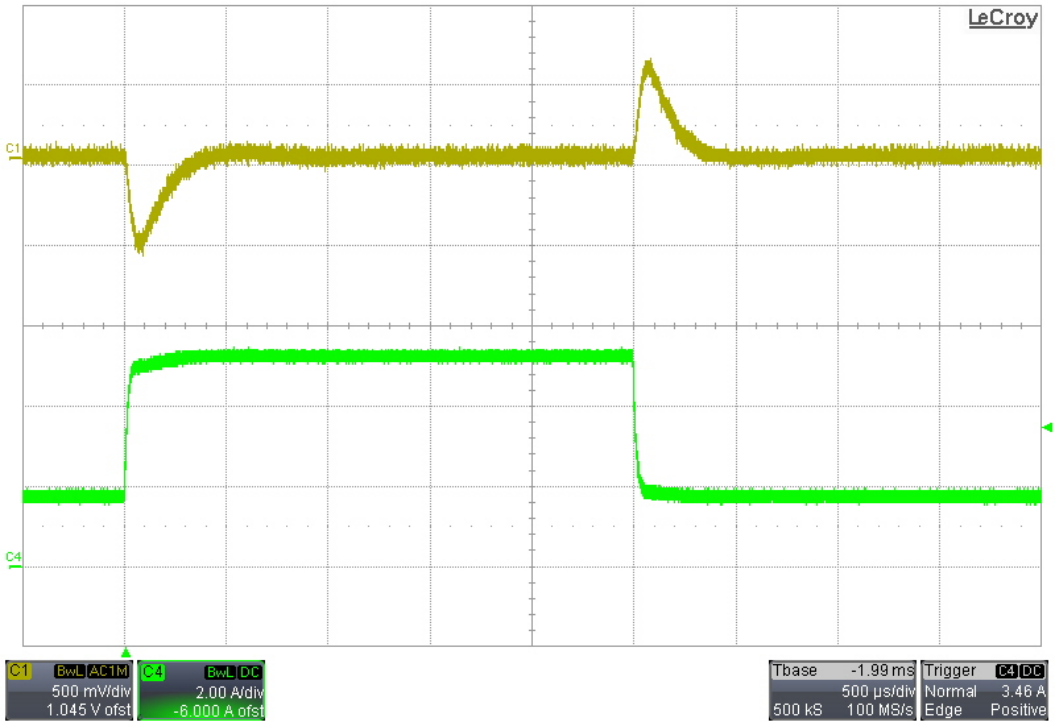


6 Frequency Response

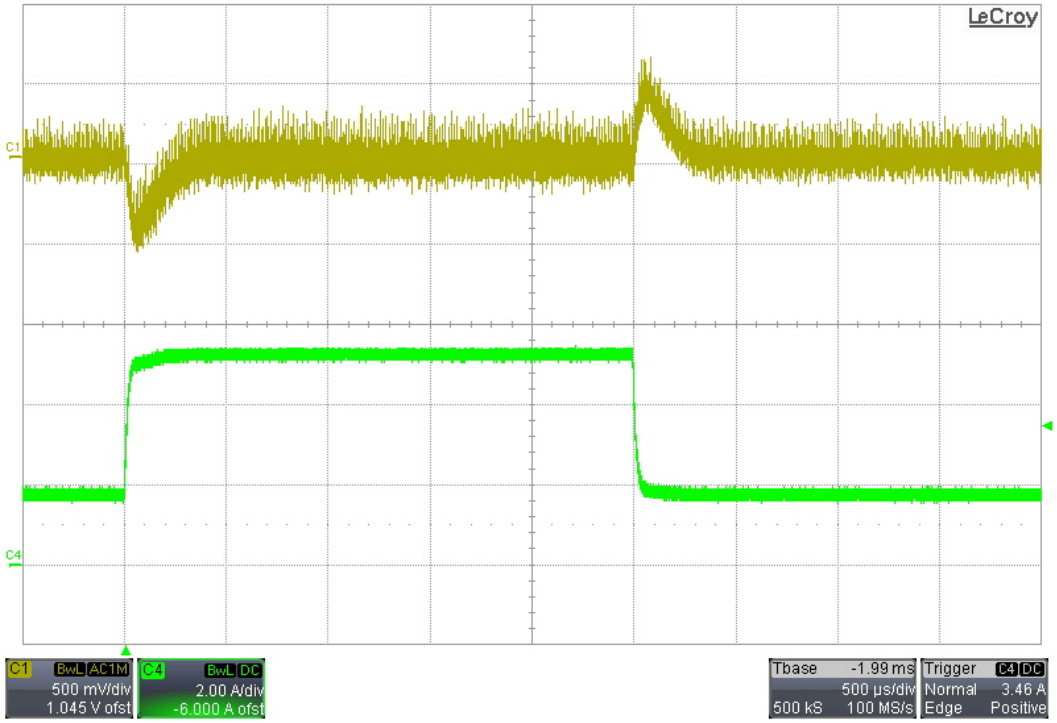


7 Load Transients

7.1 8V Input, 1.75A to 5.25A

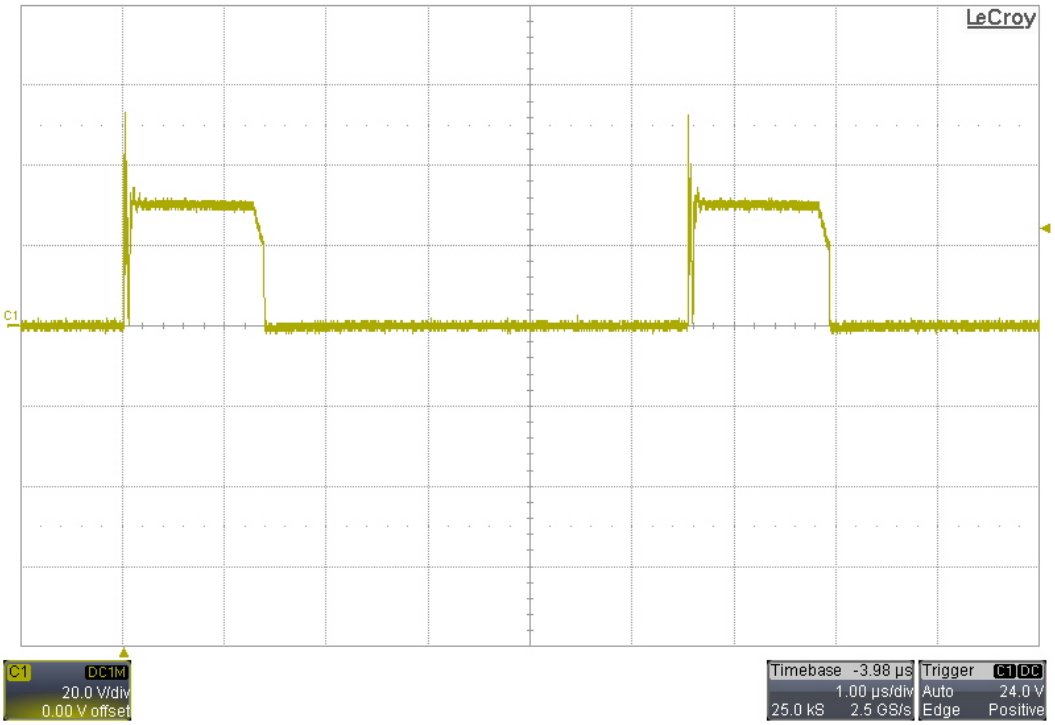


7.2 36V Input, 1.75A to 5.25A

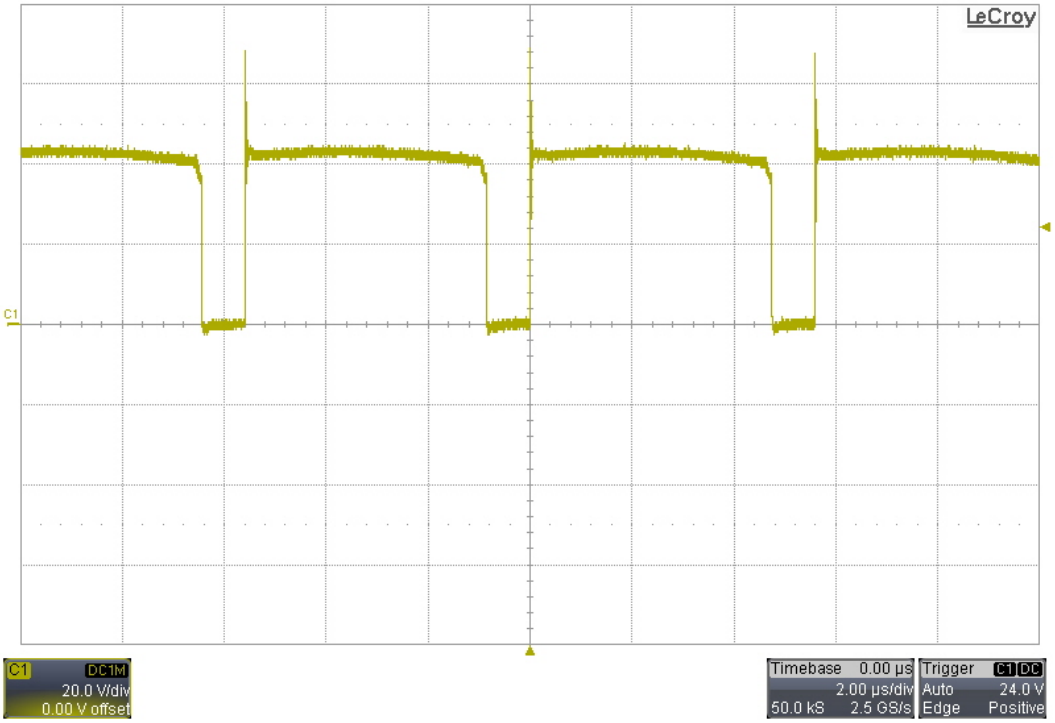


8 Switching Waveforms

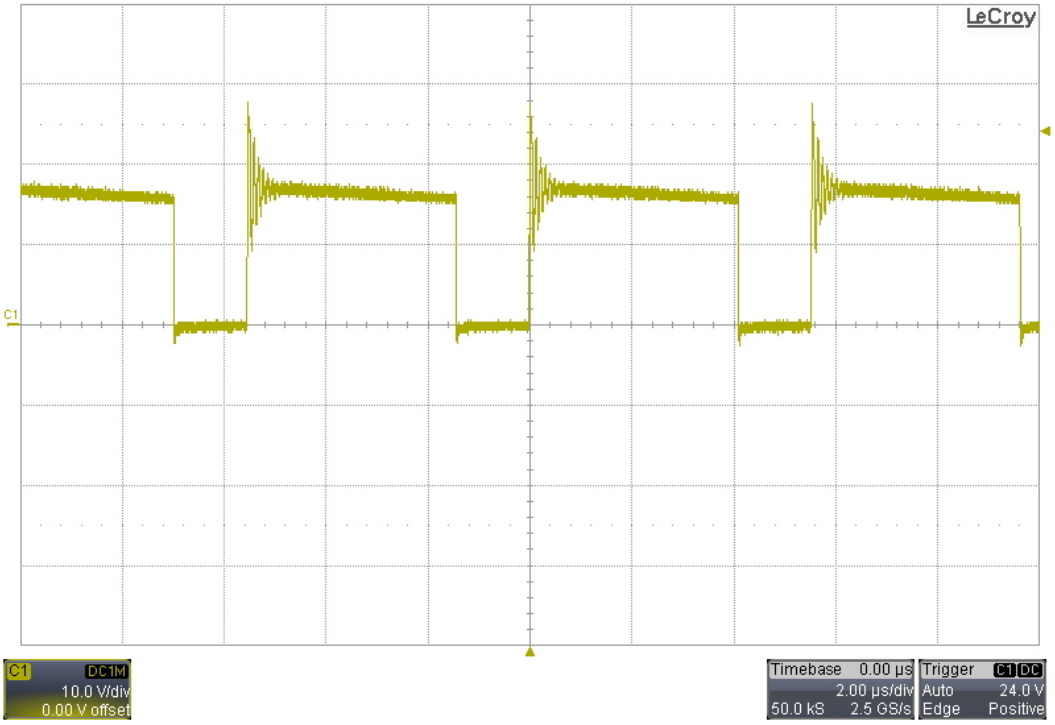
8.1 Primary FET Vds (Q4 & Q5) – 8Vin, 7A Load



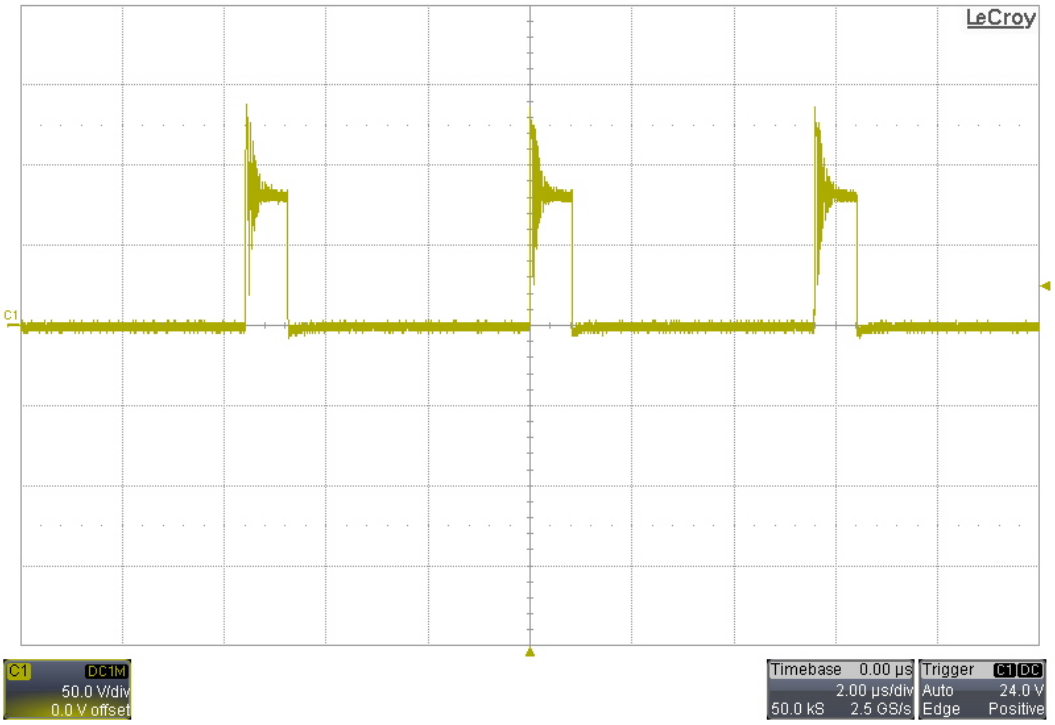
8.2 Primary FET Vds (Q4 & Q5) – 36Vin, 7A Load



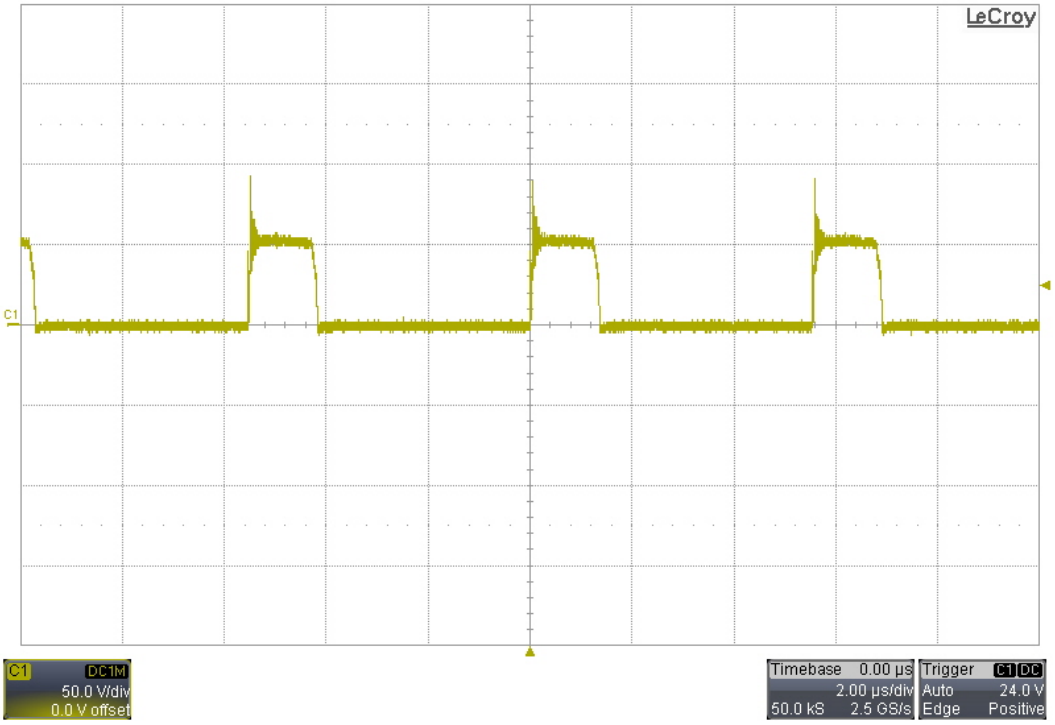
8.3 Sync FET Vds (Q2) – 8Vin, 7A Load



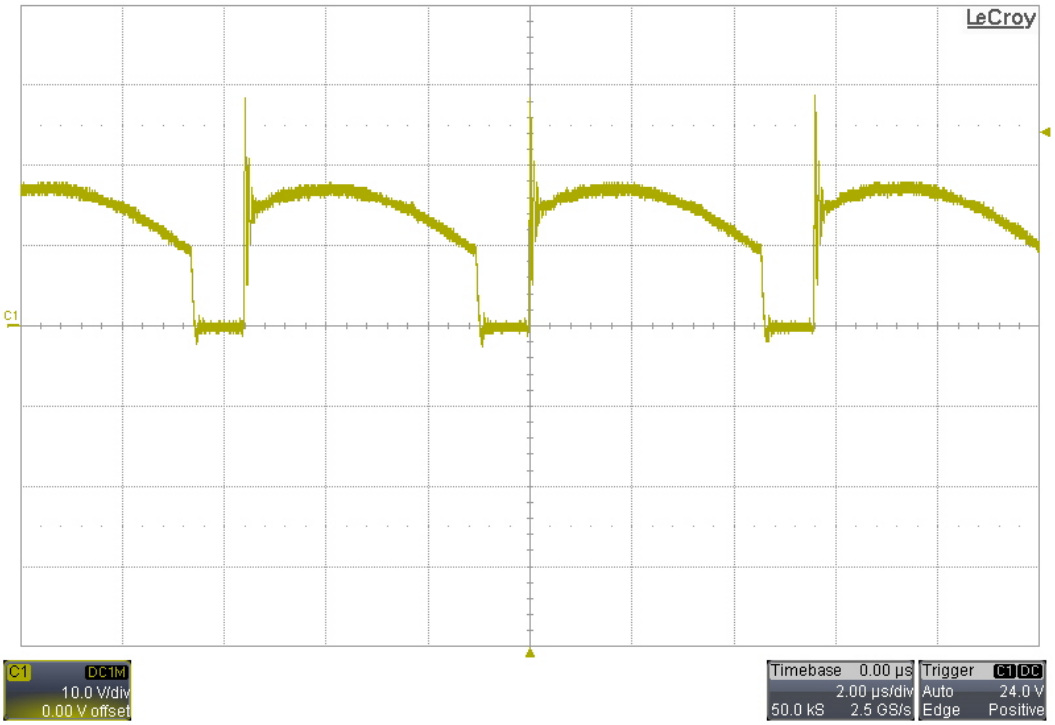
8.4 Sync FET Vds (Q2) – 36Vin, 7A Load



8.5 Sync FETs Vds (Q6) – 8Vin, 7A Load



8.6 Sync FET Vds (Q6) – 36Vin, 7A Load



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