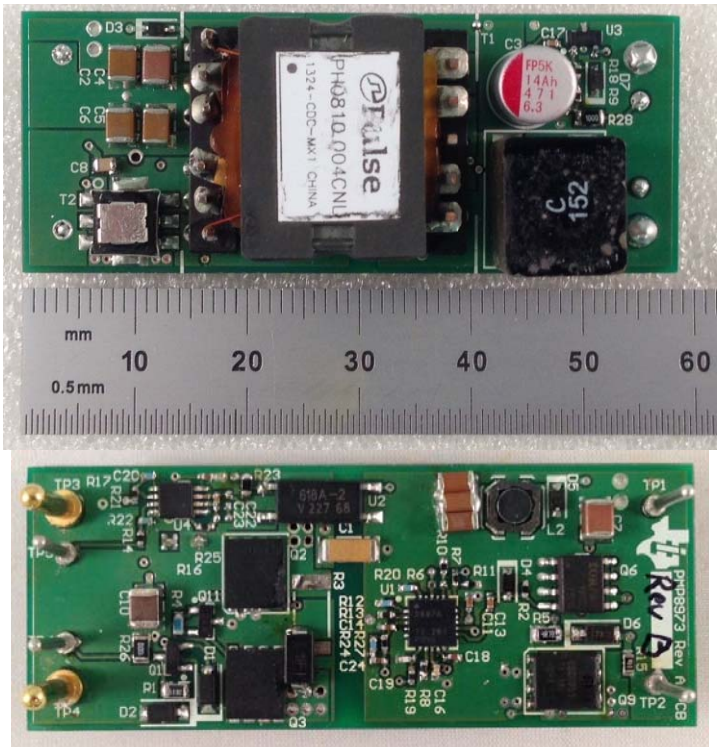
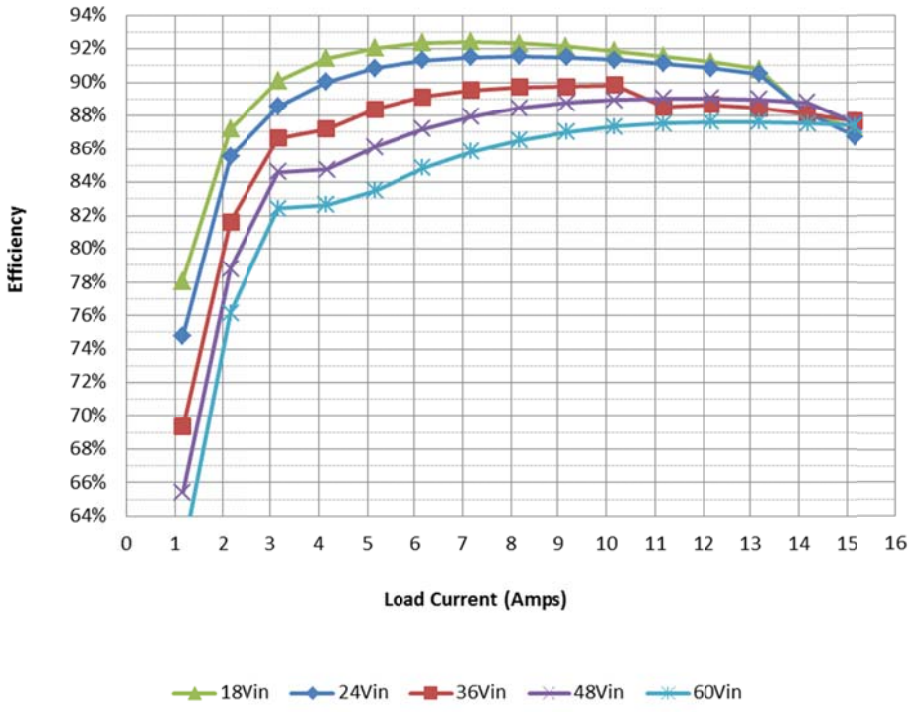
1 Photos

The circuit was built using a PMP8973 Rev A PCB.



2 Efficiency



PMP8973 Rev B Test Results

Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.001	3.29	18.0	0.072	0.00	1.291	0.2%
1.155	3.28	18.0	0.270	3.79	1.069	78.0%
2.157	3.28	18.0	0.451	7.08	1.041	87.2%
3.159	3.28	18.0	0.640	10.37	1.141	90.1%
4.161	3.28	18.0	0.830	13.66	1.280	91.4%
5.16	3.28	18.0	1.023	16.95	1.458	92.1%
6.16	3.28	18.0	1.217	20.23	1.670	92.4%
7.17	3.28	18.0	1.414	23.51	1.927	92.4%
8.17	3.28	18.0	1.612	26.80	2.224	92.3%
9.17	3.28	18.0	1.814	30.08	2.563	92.1%
10.17	3.28	18.0	2.017	33.36	2.945	91.9%
11.17	3.28	18.0	2.222	36.63	3.370	91.6%
12.17	3.28	18.0	2.430	39.90	3.842	91.2%
13.17	3.28	18.0	2.642	43.17	4.378	90.8%
14.18	3.28	18.0	2.932	46.45	6.319	88.0%
15.18	3.28	18.0	3.166	49.72	7.264	87.3%

Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.002	3.28	24.0	0.059	0.01	1.418	0.4%
1.159	3.28	24.0	0.212	3.81	1.283	74.8%
2.159	3.28	24.0	0.345	7.09	1.199	85.5%
3.162	3.28	24.0	0.488	10.38	1.341	88.6%
4.163	3.28	24.0	0.633	13.67	1.513	90.0%
5.17	3.28	24.0	0.777	16.95	1.704	90.9%
6.17	3.28	24.0	0.923	20.23	1.925	91.3%
7.17	3.28	24.0	1.071	23.52	2.181	91.5%
8.17	3.28	24.0	1.220	26.80	2.472	91.6%
9.17	3.28	24.0	1.370	30.08	2.797	91.5%
10.17	3.28	24.0	1.522	33.36	3.161	91.3%
11.17	3.28	24.0	1.675	36.63	3.566	91.1%
12.17	3.28	24.0	1.830	39.90	4.017	90.9%
13.17	3.28	24.0	1.987	43.18	4.513	90.5%
14.18	3.28	24.0	2.196	46.45	6.240	88.2%
15.18	3.28	24.0	2.389	49.72	7.598	86.7%

Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.002	3.29	36.0	0.051	0.01	1.838	0.3%
1.160	3.28	36.0	0.153	3.81	1.685	69.3%
2.161	3.28	36.0	0.241	7.10	1.597	81.6%
3.163	3.28	36.0	0.333	10.39	1.601	86.6%
4.163	3.28	36.0	0.435	13.67	2.005	87.2%
5.17	3.28	36.0	0.533	16.96	2.223	88.4%
6.17	3.28	36.0	0.631	20.23	2.466	89.1%
7.17	3.28	36.0	0.730	23.52	2.748	89.5%
8.17	3.28	36.0	0.830	26.80	3.071	89.7%
9.17	3.28	36.0	0.931	30.08	3.435	89.8%
10.17	3.28	36.0	1.032	33.36	3.775	89.8%
11.173	3.28	36.0	1.150	36.63	4.751	88.5%
12.173	3.28	36.0	1.250	39.90	5.104	88.7%
13.176	3.28	36.0	1.356	43.18	5.633	88.5%
14.178	3.28	36.0	1.465	46.45	6.282	88.1%
15.178	3.28	36.0	1.575	49.72	6.972	87.7%

PMP8973 Rev B Test Results

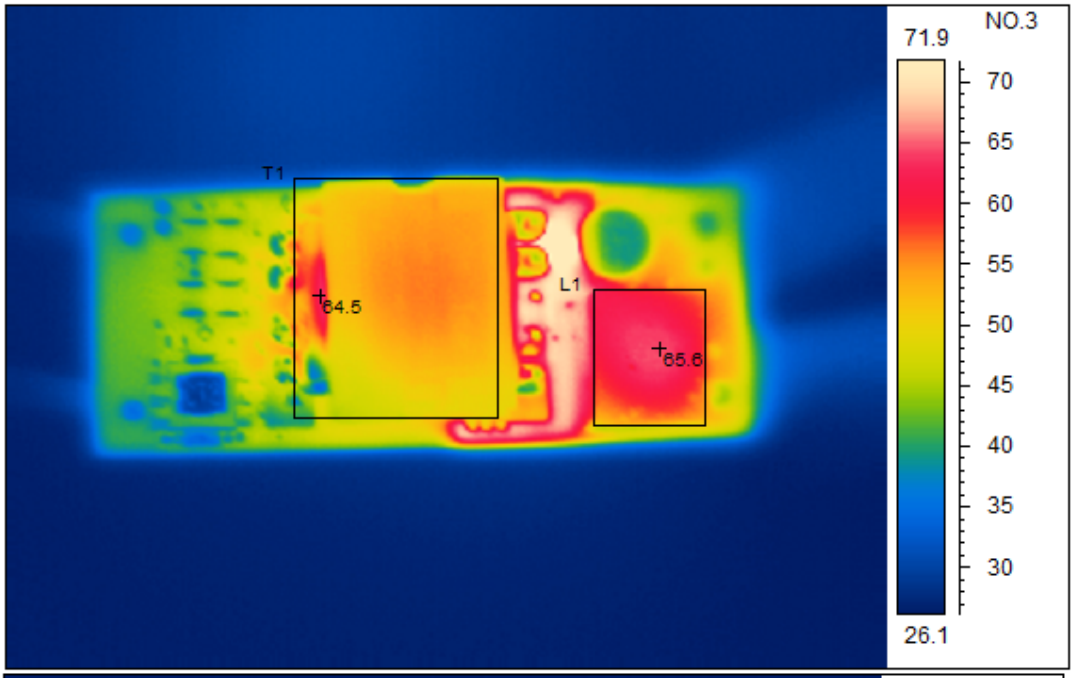
Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.002	3.29	48.0	0.045	0.01	2.172	0.3%
1.161	3.28	48.0	0.121	3.81	2.015	65.4%
2.162	3.28	48.0	0.188	7.10	1.909	78.8%
3.164	3.28	48.0	0.256	10.39	1.887	84.6%
4.164	3.28	48.0	0.336	13.67	2.460	84.7%
5.17	3.28	48.0	0.410	16.96	2.735	86.1%
6.17	3.28	48.0	0.484	20.24	2.968	87.2%
7.17	3.28	48.0	0.557	23.52	3.224	87.9%
8.17	3.28	48.0	0.632	26.81	3.501	88.4%
9.17	3.28	48.0	0.706	30.08	3.809	88.8%
10.17	3.28	48.0	0.781	33.36	4.140	89.0%
11.174	3.28	48.0	0.857	36.63	4.506	89.0%
12.175	3.28	48.0	0.934	39.91	4.907	89.1%
13.176	3.28	48.0	1.011	43.18	5.343	89.0%
14.179	3.28	48.0	1.090	46.46	5.855	88.8%
15.179	3.28	48.0	1.183	49.72	7.067	87.6%

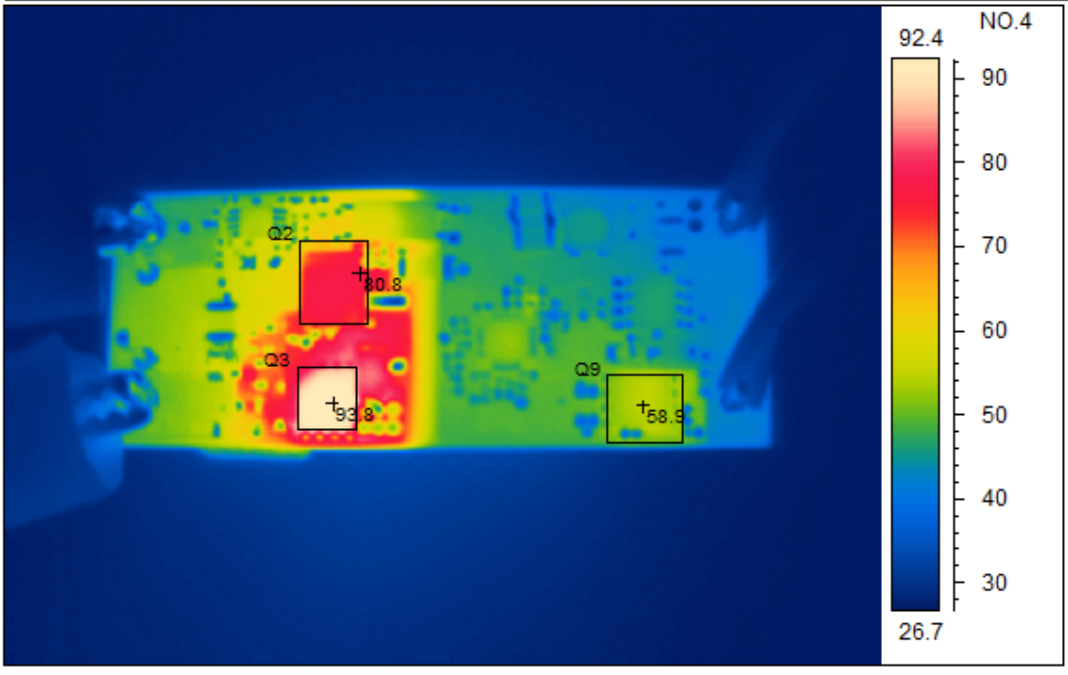
Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.002	3.29	60.0	0.043	0.01	2.555	0.2%
1.161	3.28	60.0	0.103	3.81	2.353	61.8%
2.162	3.28	60.0	0.155	7.10	2.224	76.1%
3.164	3.28	60.0	0.210	10.39	2.217	82.4%
4.164	3.28	60.0	0.276	13.67	2.871	82.6%
5.17	3.28	60.0	0.339	16.96	3.348	83.5%
6.17	3.28	60.0	0.397	20.24	3.608	84.9%
7.17	3.28	60.0	0.457	23.53	3.883	85.8%
8.17	3.28	60.0	0.516	26.81	4.174	86.5%
9.17	3.28	60.0	0.576	30.08	4.490	87.0%
10.18	3.28	60.0	0.637	33.37	4.838	87.3%
11.174	3.28	60.0	0.698	36.63	5.220	87.5%
12.175	3.28	60.0	0.759	39.91	5.640	87.6%
13.177	3.28	60.0	0.822	43.18	6.102	87.6%
14.179	3.28	60.0	0.885	46.46	6.612	87.5%
15.180	3.28	60.0	0.948	49.73	7.165	87.4%

3 Thermal Images

All thermal images were captured with 25°C ambient, 15A load, and 200LFM air flow.

3.1 48Vin Thermal Images





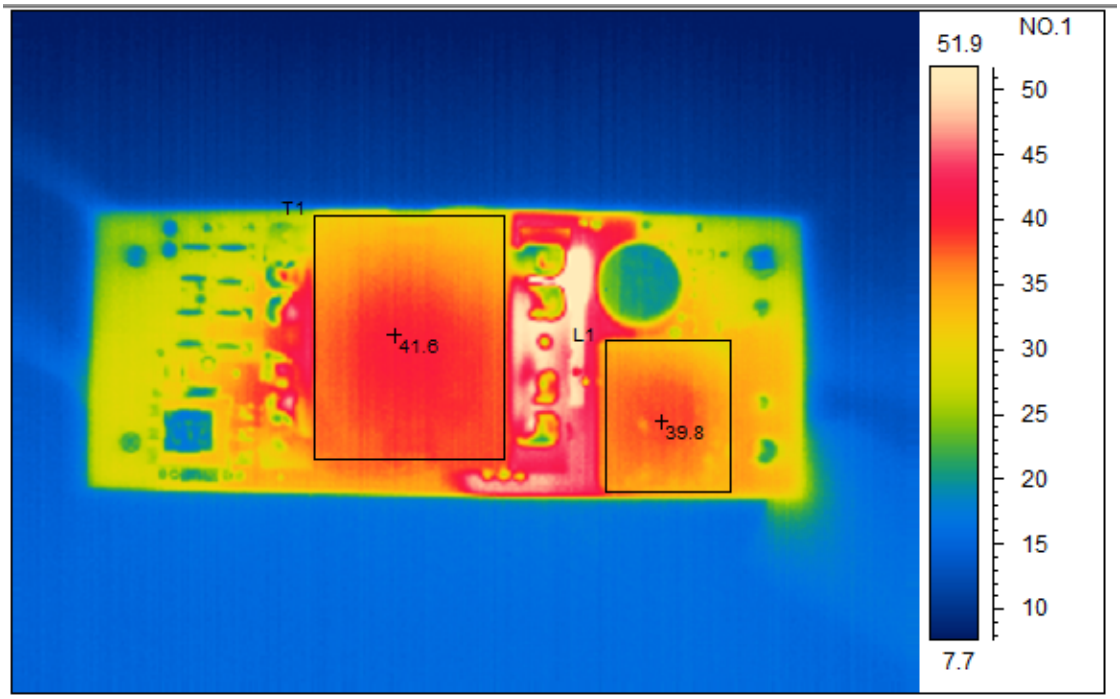
NO.3

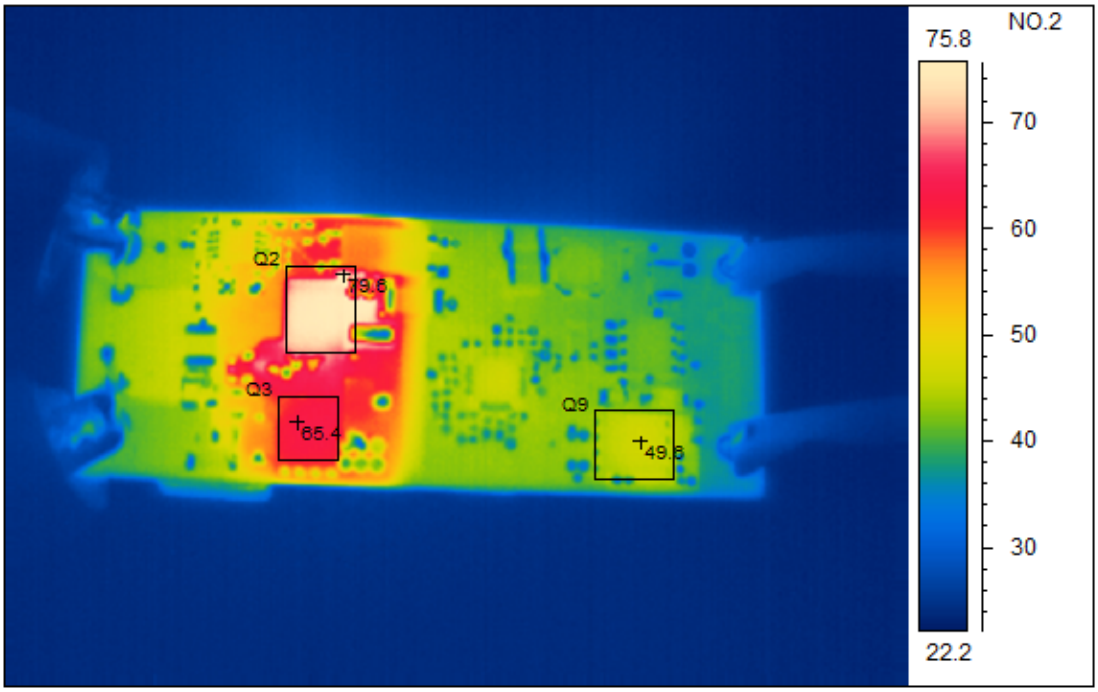
Area analysis	Value
T1 Max	64.5°C
L1 Max	65.6°C

NO.4

Area analysis	Value
Q2Max	80.8°C
Q3Max	93.8°C
Q9 Max	58.9°C

3.2 24Vin Thermal Images





NO.1

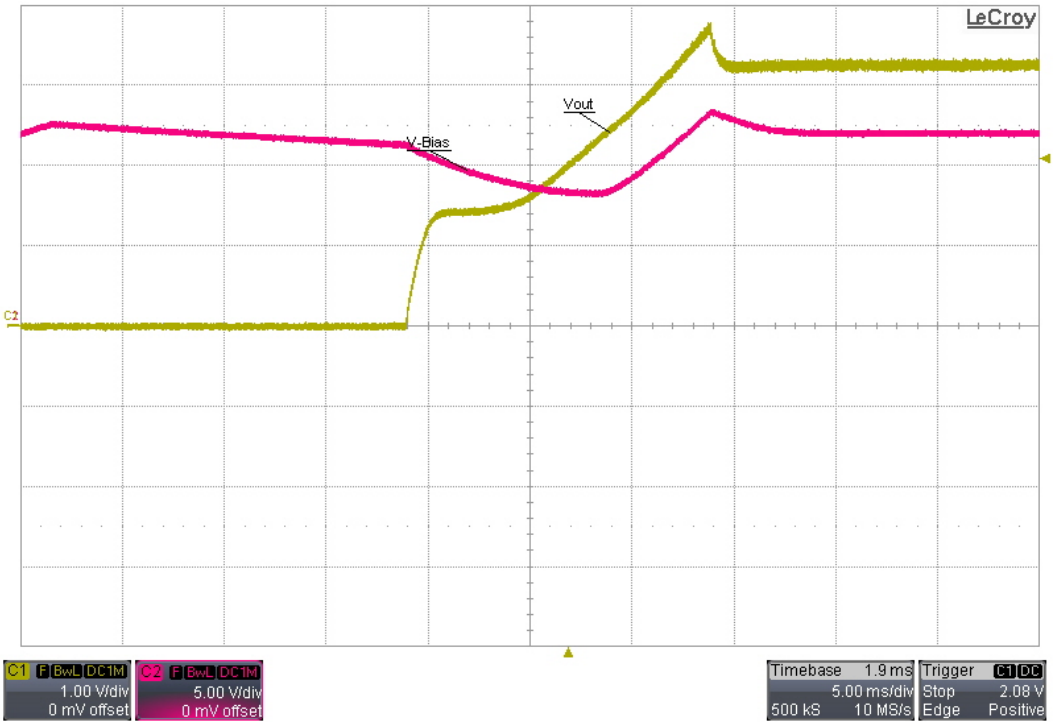
Area analysis	Value
T1 Max	41.6°C
L1 Max	39.8°C

NO.2

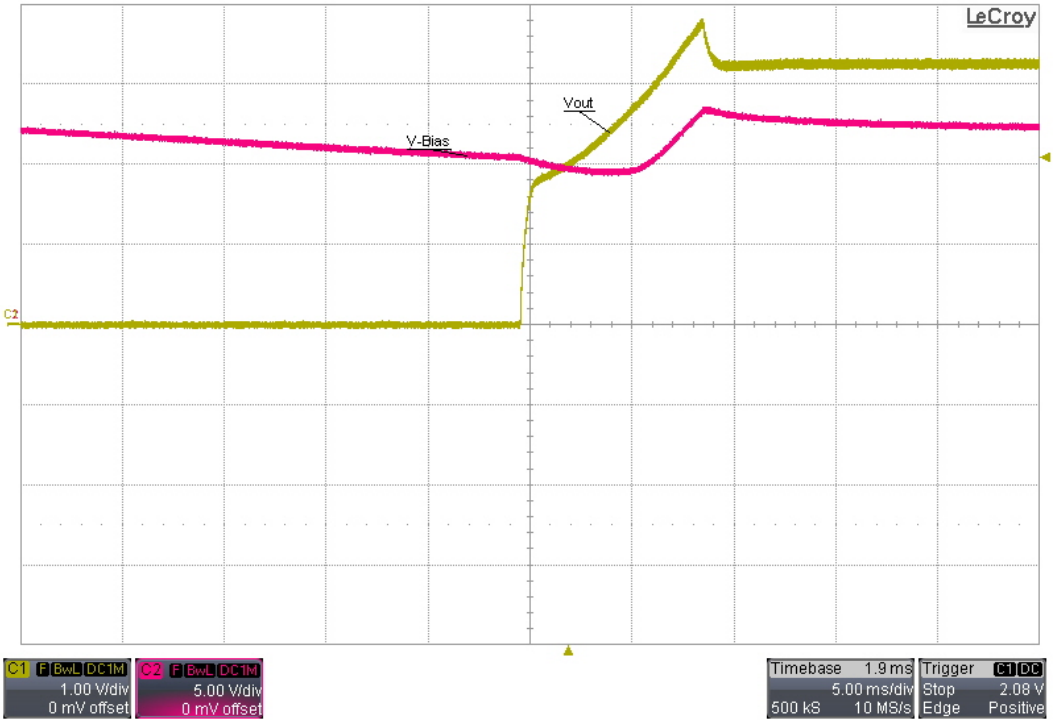
Area analysis	Value
Q2Max	79.6°C
Q3Max	65.4°C
Q9 Max	49.6°C

4 Startup

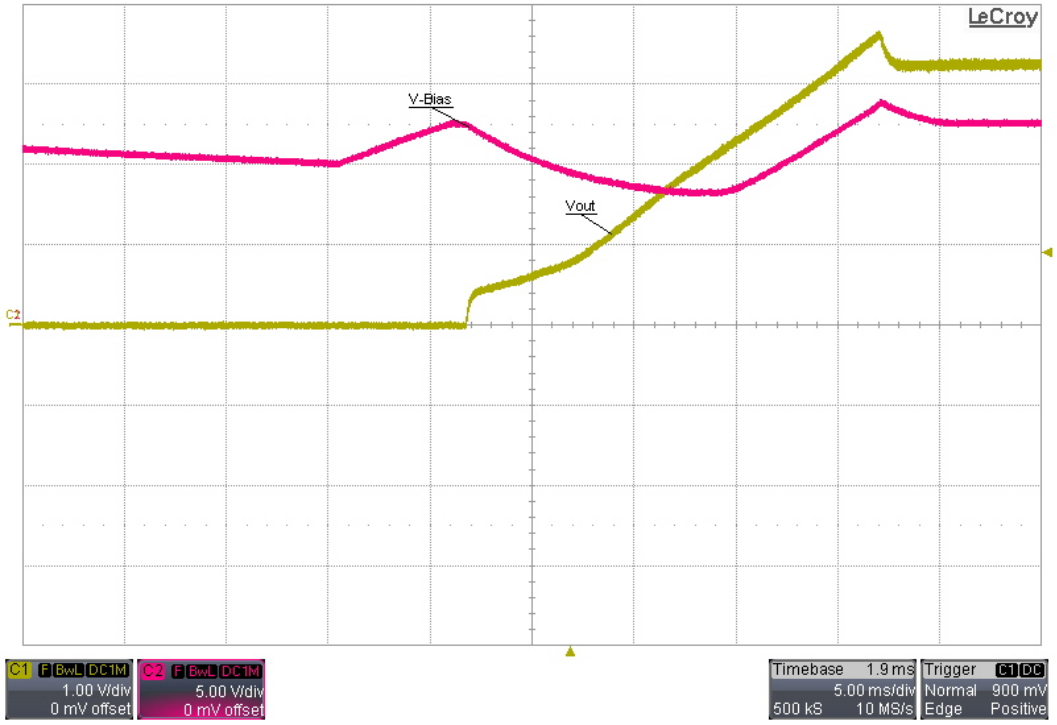
4.1 18V Input, No Load



4.2 60V Input, No Load



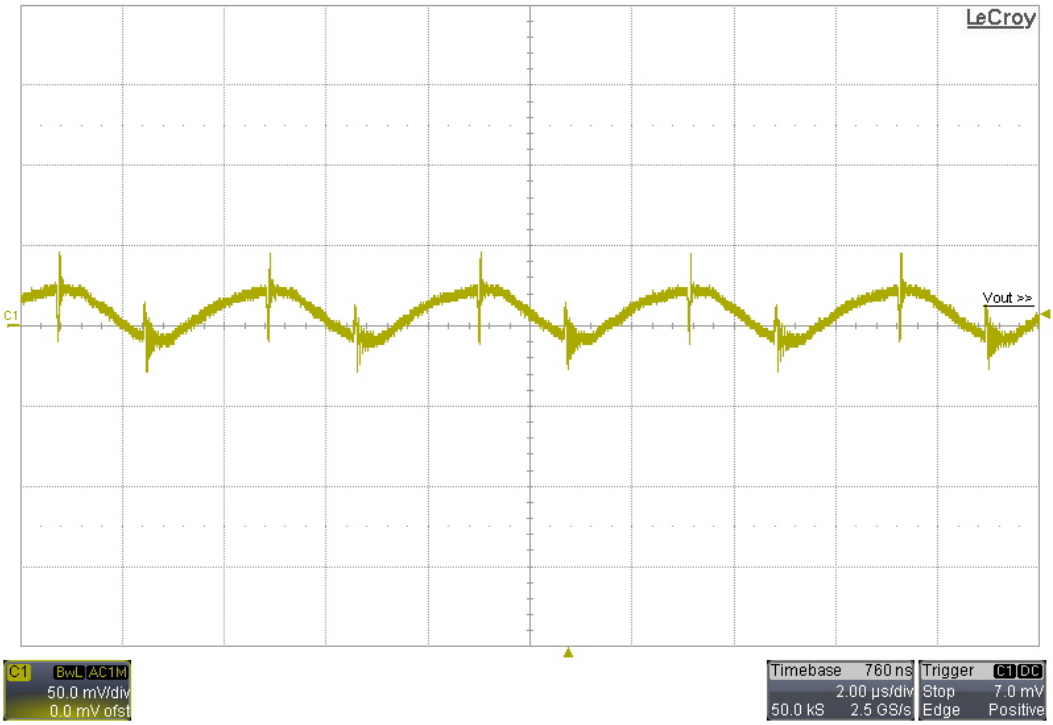
4.3 18V Input, 0.5Ω Load



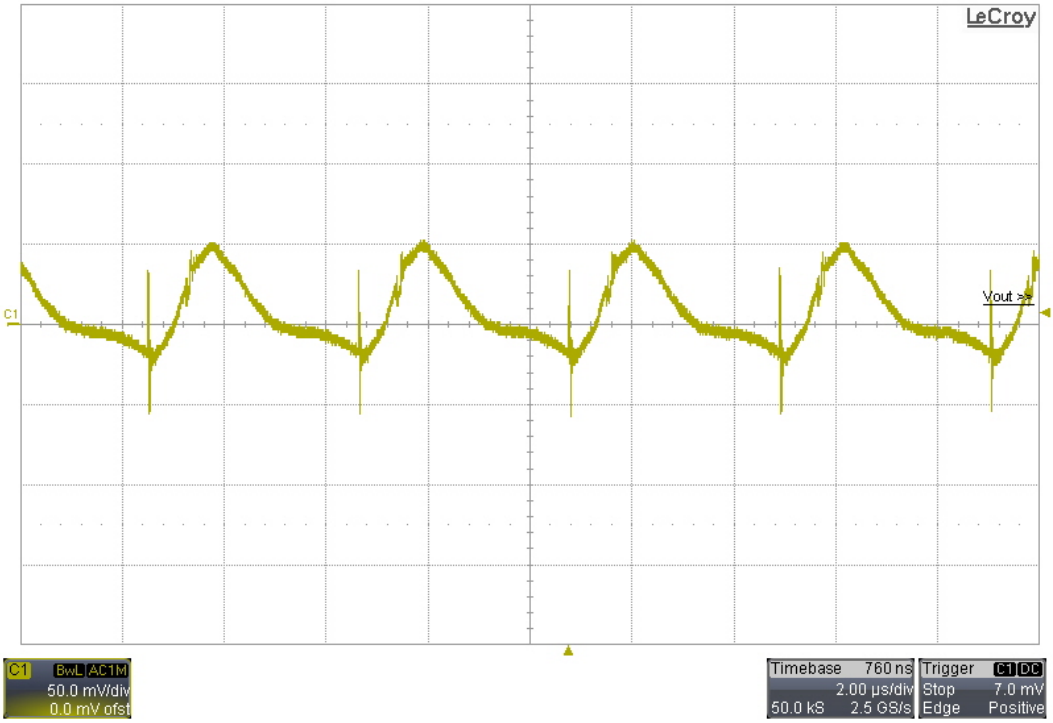
4.4 60V Input, 0.5Ω Load

5 Output Ripple Voltage

5.1 18V Input, 15A Load Ripple



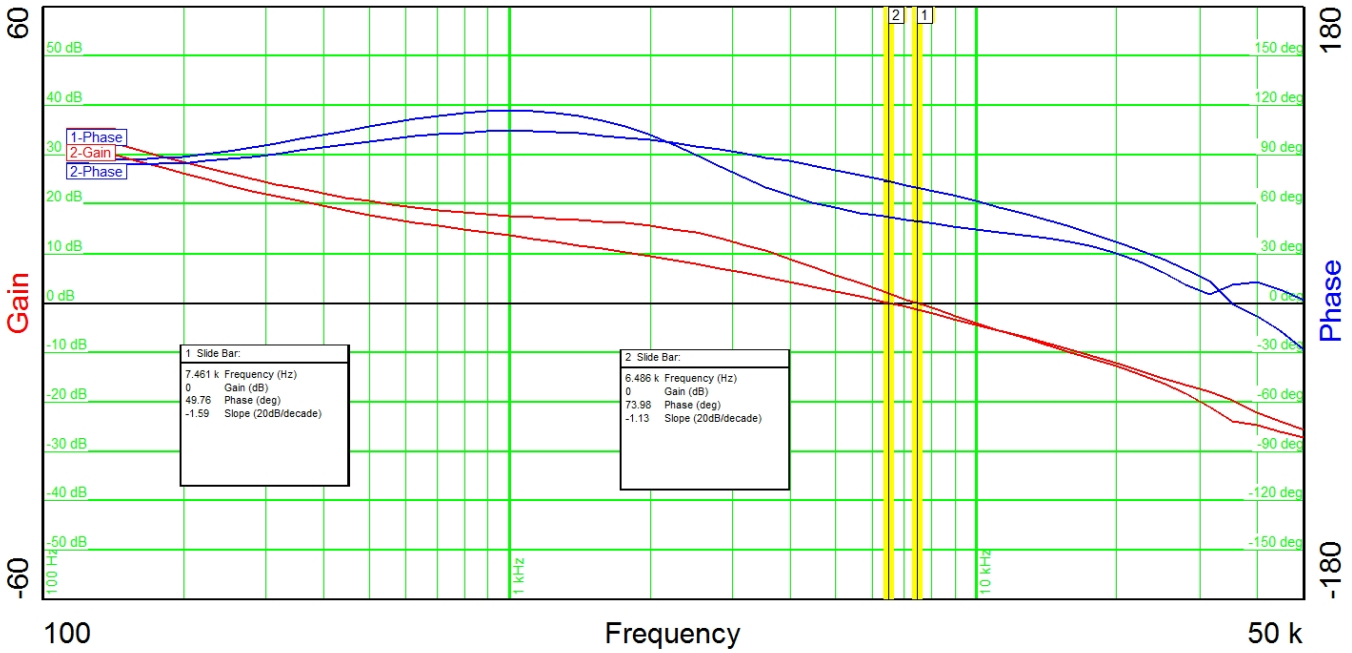
5.2 60Vin, 15A Load Ripple



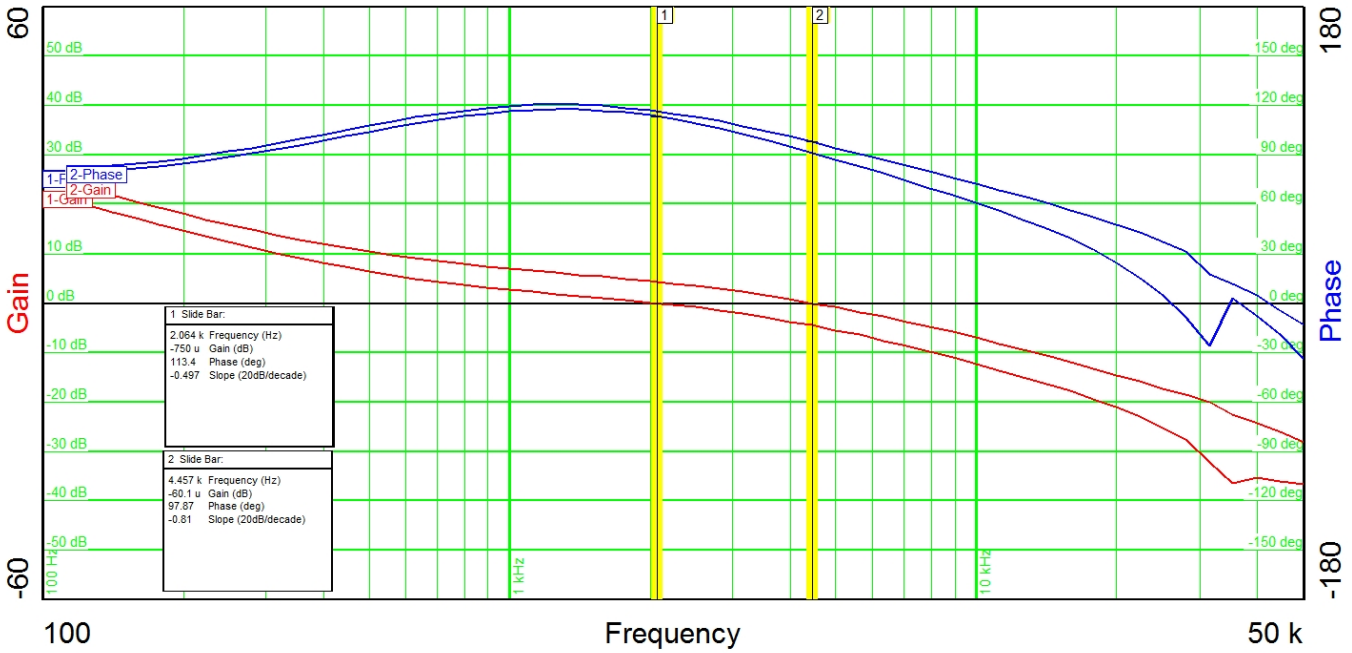
6 Frequency Response

For gain/phase plot #1, the input was 18V. For gain/phase plot #2, the input was 60V.

6.1 No Load

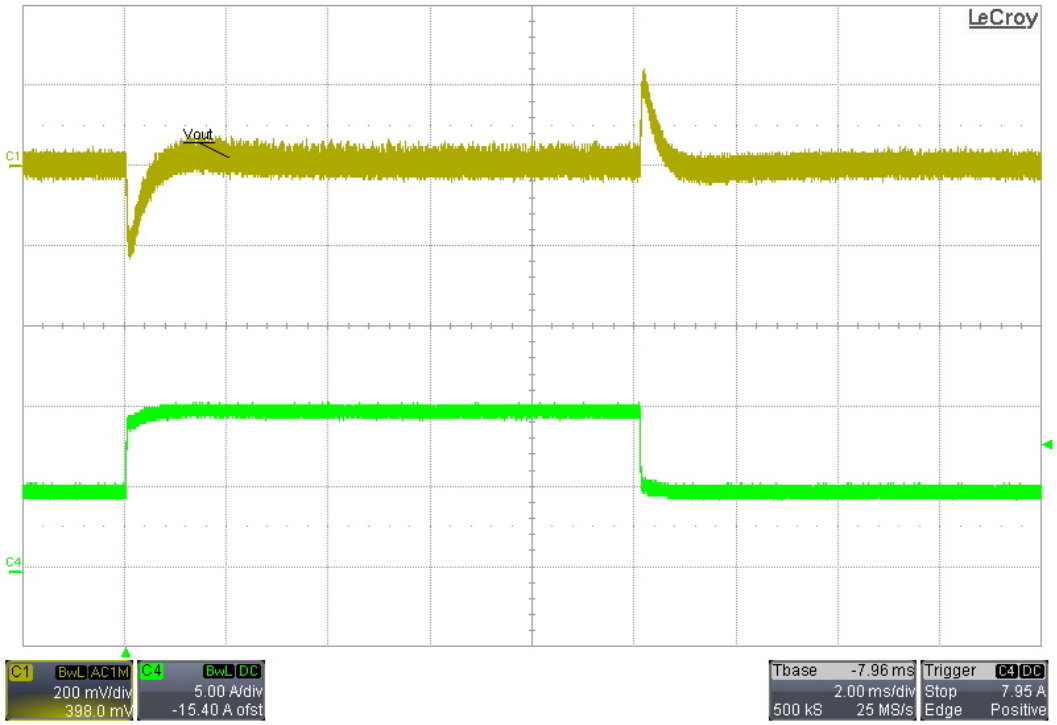


6.2 15A Load

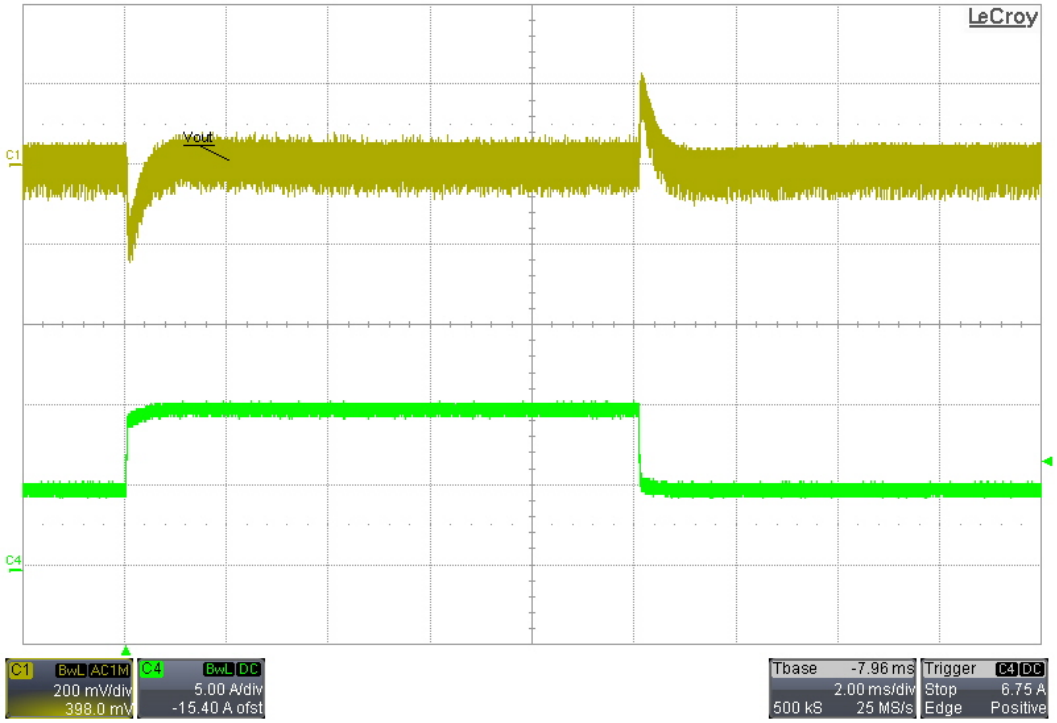


7 Load Transients

7.1 18V Input, 5A to 10A Transient

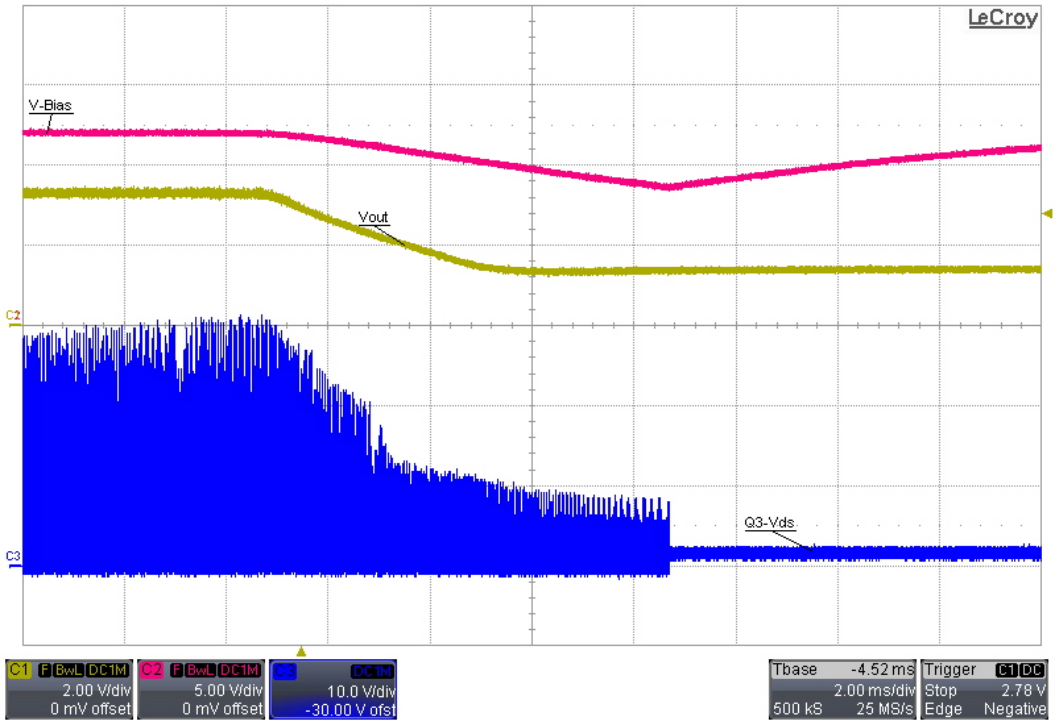


7.2 60V Input, 5A to 10A Transient



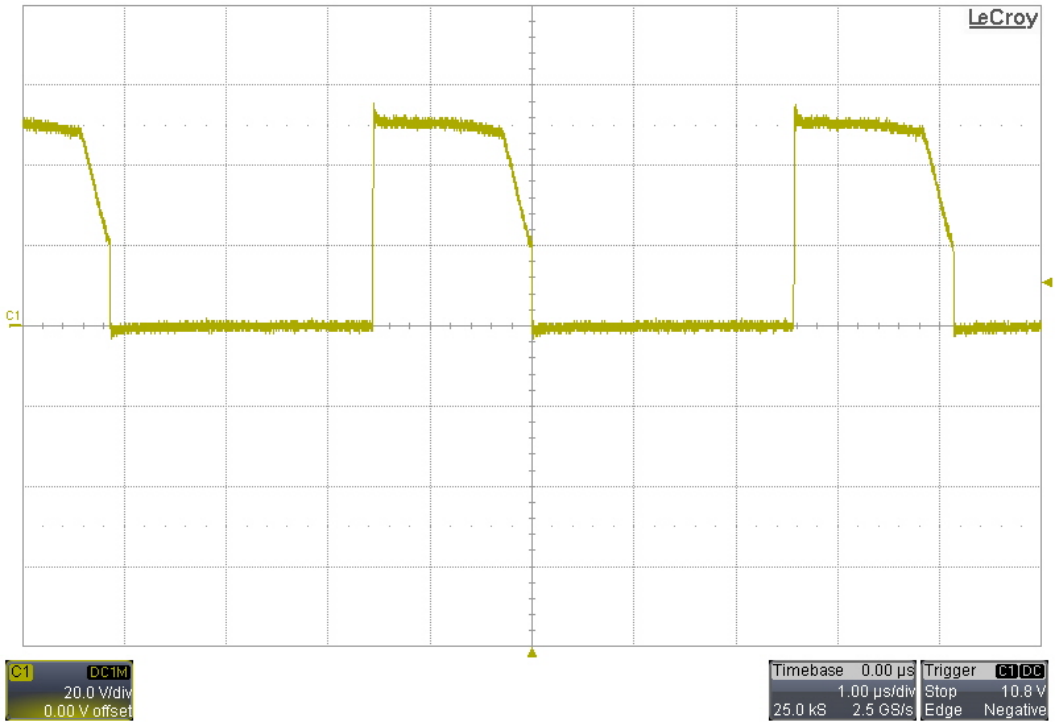
8 Shutdown

The output was unloaded.

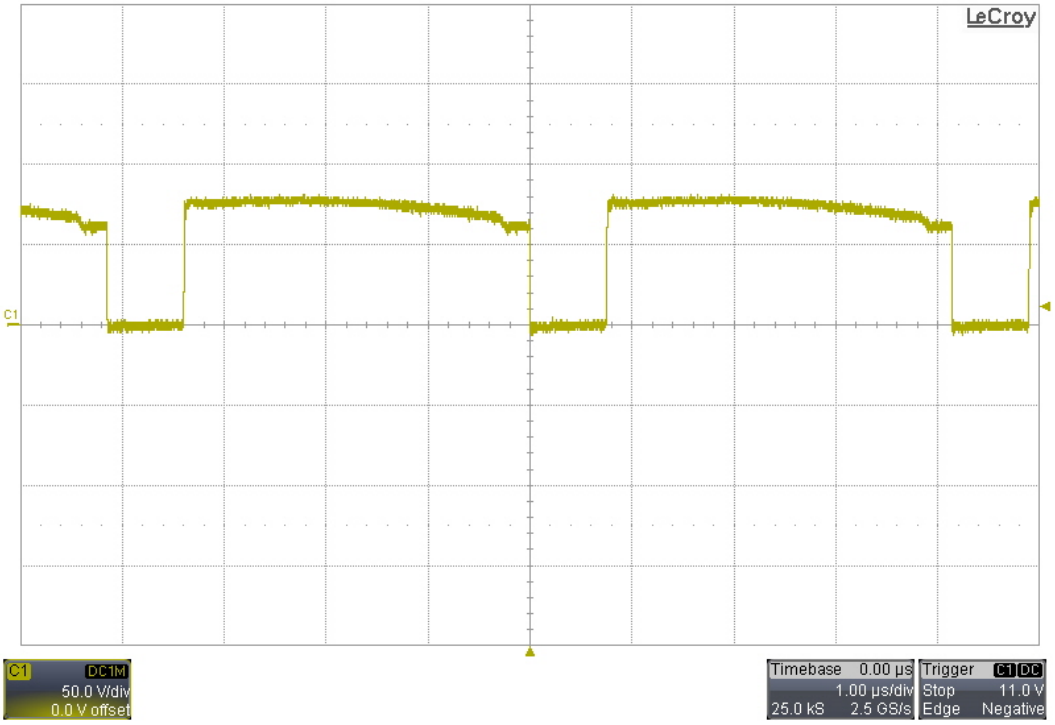


9 Switching Waveforms

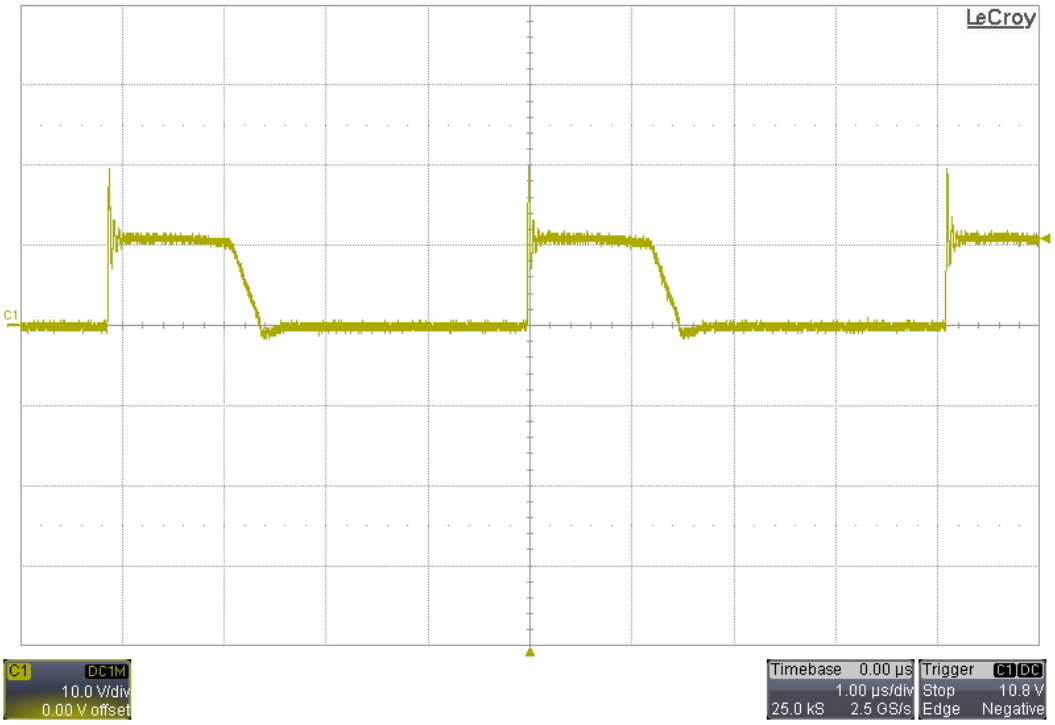
9.1 Primary FET Vds (Q9) – 18Vin, 15A Load



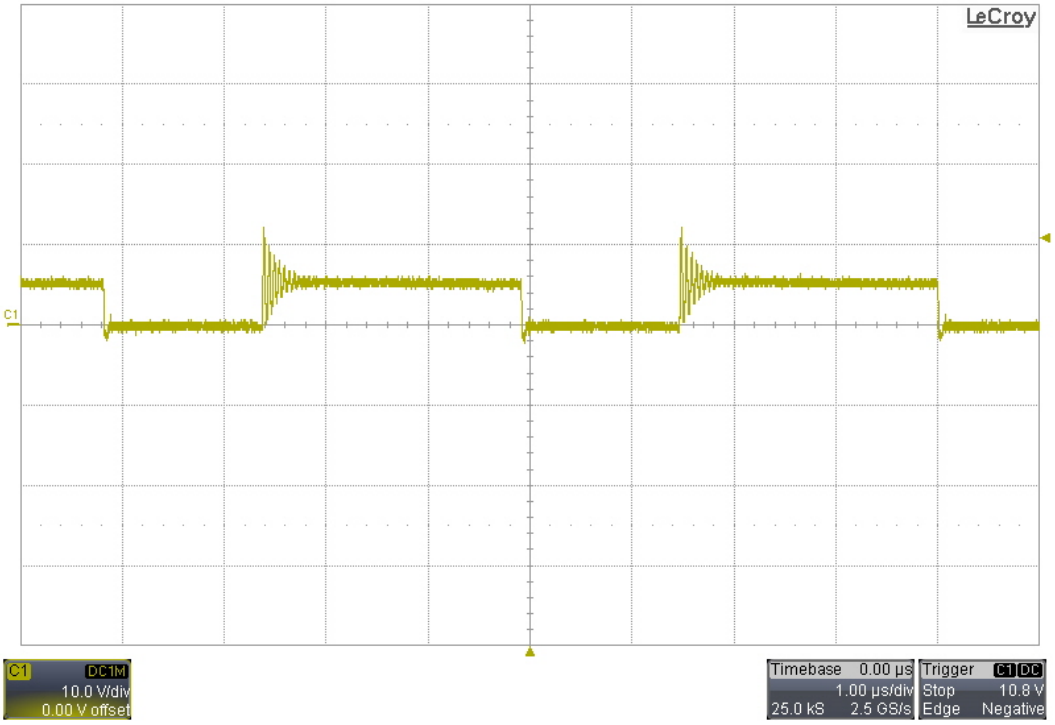
9.2 Primary FET Vds (Q9) – 60Vin, 15A Load



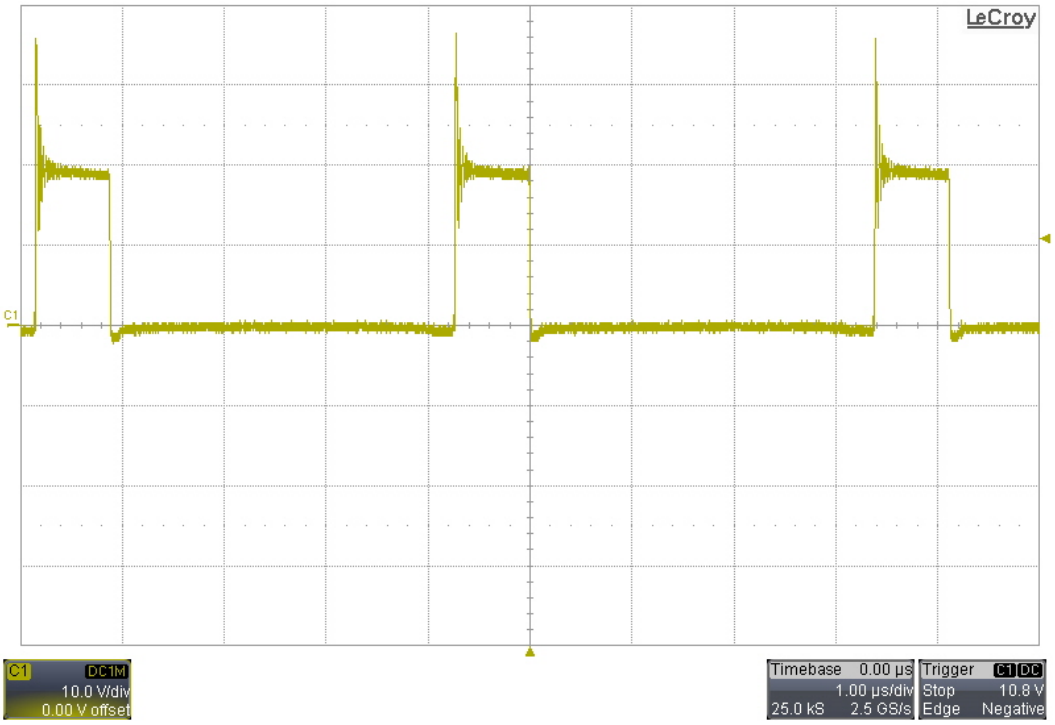
9.3 Sync FET Vds (Q2) – 18Vin, 15A Load



9.4 Sync FET Vds (Q3) – 18Vin, 15A Load



9.5 Sync FET Vds (Q3) – 60Vin, 15A Load



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