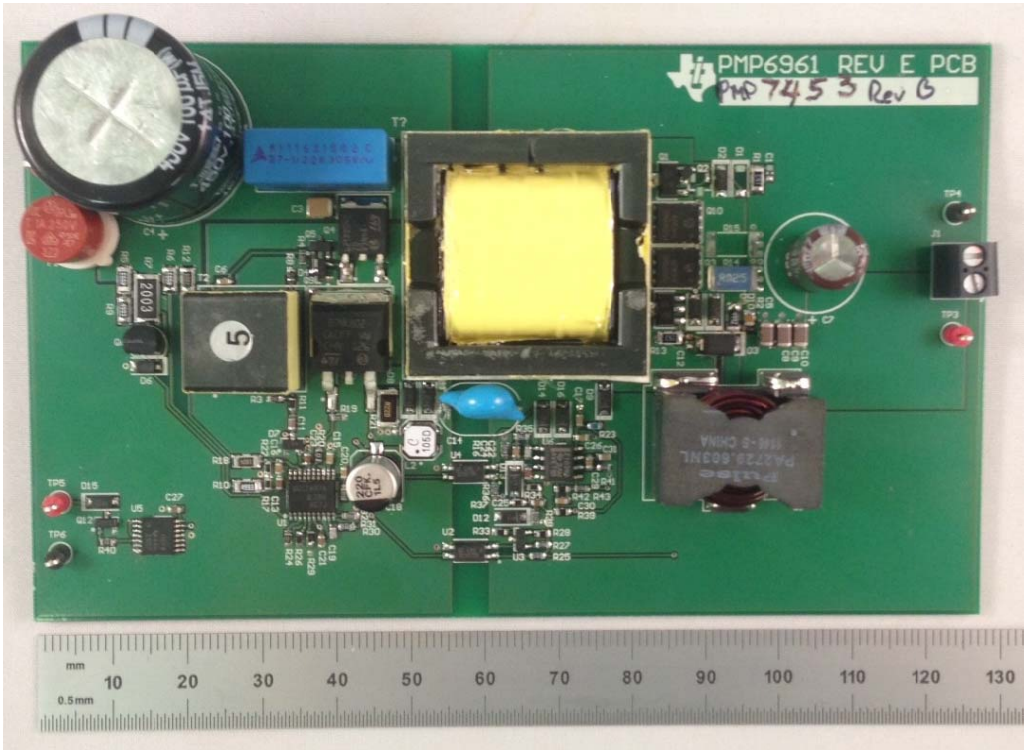
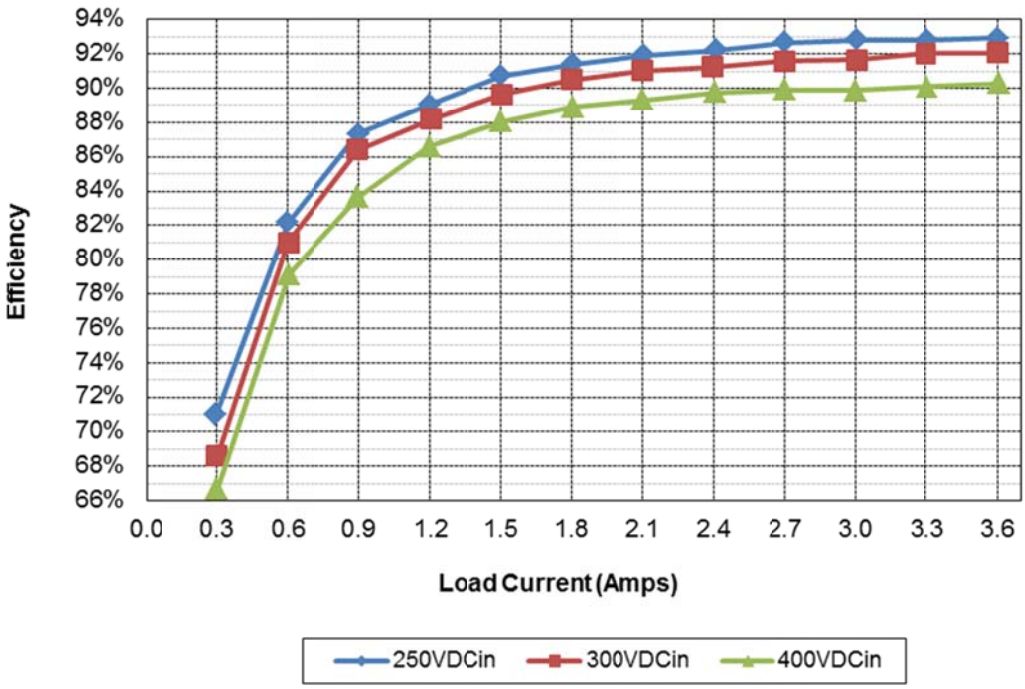
1 Photo

The photograph below shows the PMP7453 Rev B demo board. This circuit was build using a PMP6961 Rev E PCB.



2 Efficiency



PMP7453 Rev B Test Results

250VDCin							
Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.000	27.48	250.0	0.014	3.50	0.00	3.50	0.0%
0.297	27.48	250.0	0.046	11.50	8.16	3.34	71.0%
0.598	27.48	250.0	0.080	20.00	16.43	3.57	82.2%
0.898	27.47	250.0	0.113	28.25	24.67	3.58	87.3%
1.199	27.47	249.9	0.148	36.99	32.94	4.05	89.1%
1.502	27.47	249.9	0.182	45.48	41.26	4.22	90.7%
1.804	27.47	249.9	0.217	54.23	49.56	4.67	91.4%
2.107	27.47	249.9	0.252	62.97	57.88	5.10	91.9%
2.408	27.47	249.9	0.287	71.72	66.15	5.57	92.2%
2.705	27.47	249.8	0.321	80.19	74.31	5.88	92.7%
3.006	27.46	249.8	0.356	88.93	82.54	6.38	92.8%
3.302	27.45	249.8	0.391	97.67	90.64	7.03	92.8%
3.602	27.45	249.8	0.426	106.41	98.87	7.54	92.9%

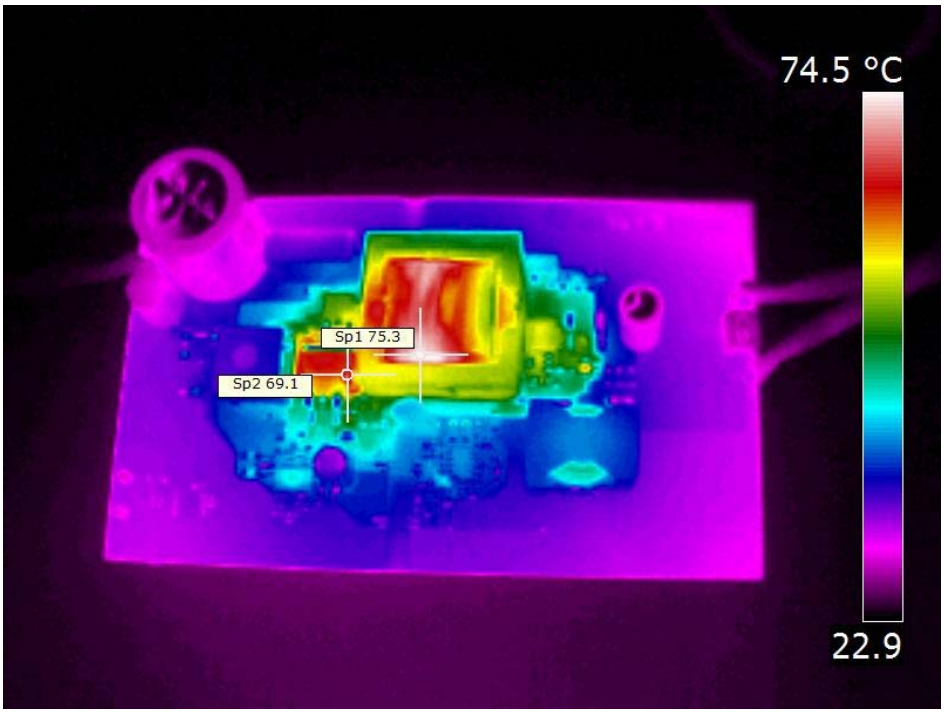
300VDCin							
Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.000	27.47	300.3	0.014	4.20	0.00	4.20	0.0%
0.300	27.47	300.3	0.040	12.01	8.24	3.77	68.6%
0.602	27.47	300.2	0.068	20.41	16.54	3.88	81.0%
0.897	27.47	300.2	0.095	28.52	24.64	3.88	86.4%
1.205	27.46	300.2	0.125	37.53	33.09	4.44	88.2%
1.509	27.46	300.2	0.154	46.23	41.44	4.79	89.6%
1.801	27.46	300.2	0.182	54.64	49.46	5.18	90.5%
2.100	27.46	300.2	0.211	63.34	57.67	5.68	91.0%
2.393	27.46	300.1	0.240	72.02	65.71	6.31	91.2%
2.702	27.46	300.1	0.270	81.03	74.20	6.83	91.6%
3.006	27.45	300.1	0.300	90.03	82.51	7.52	91.7%
3.300	27.45	300.1	0.328	98.43	90.59	7.85	92.0%
3.603	27.45	300.1	0.358	107.44	98.90	8.53	92.1%

400VDCin							
Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.000	28.47	387.5	0.012	4.65	0.00	4.65	0.0%
0.301	27.46	387.5	0.032	12.40	8.27	4.13	66.7%
0.603	27.46	387.4	0.054	20.92	16.56	4.36	79.2%
0.897	27.46	387.4	0.076	29.44	24.63	4.81	83.7%
1.197	27.46	387.4	0.098	37.97	32.87	5.10	86.6%
1.503	27.46	387.4	0.121	46.88	41.27	5.60	88.0%
1.806	27.46	387.4	0.144	55.79	49.59	6.19	88.9%
2.104	27.46	387.4	0.167	64.70	57.78	6.92	89.3%
2.406	27.46	387.4	0.190	73.61	66.07	7.54	89.8%
2.703	27.45	387.4	0.213	82.52	74.20	8.32	89.9%
2.999	27.45	387.3	0.237	91.60	82.32	9.27	89.9%
3.305	27.45	387.3	0.260	100.70	90.72	9.98	90.1%
3.605	27.45	387.3	0.283	109.61	98.96	10.65	90.3%

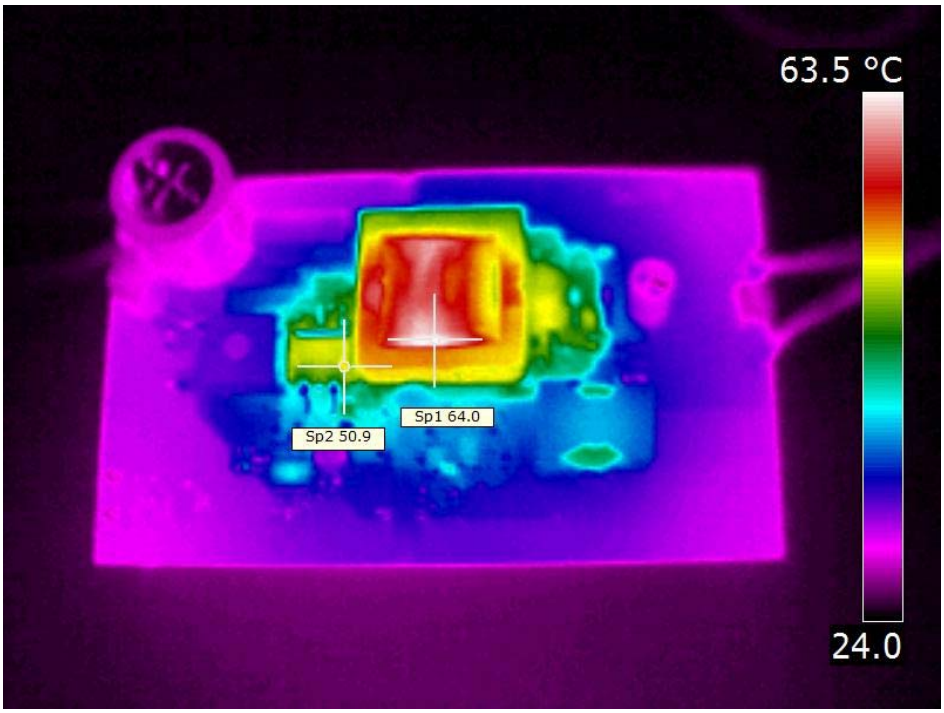
3 Thermal Images

The ambient temperature was 25C with 200LFM of forced air flow. The output was loaded with 3.6A.

3.1 400VDC Input

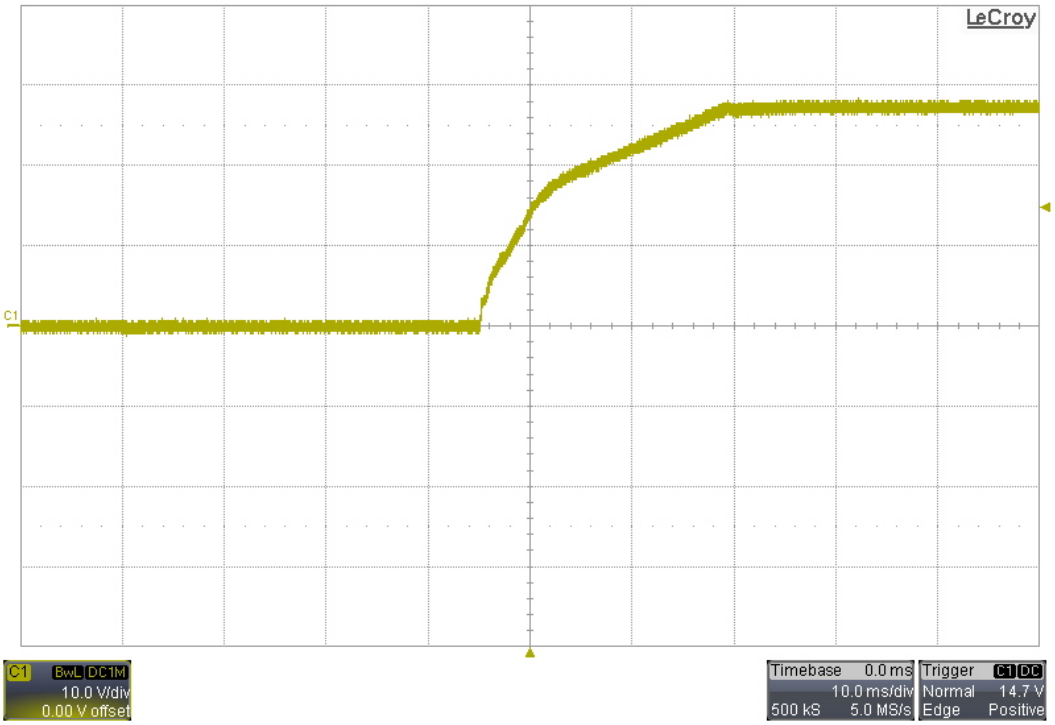


3.2 250VDC Input

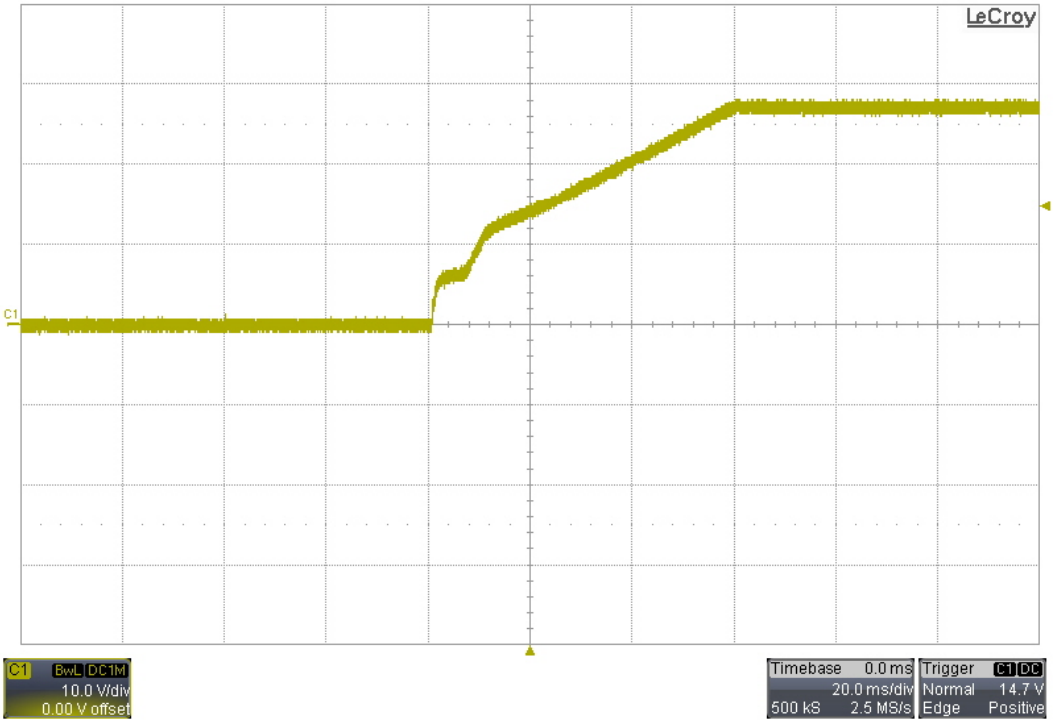


4 Startup

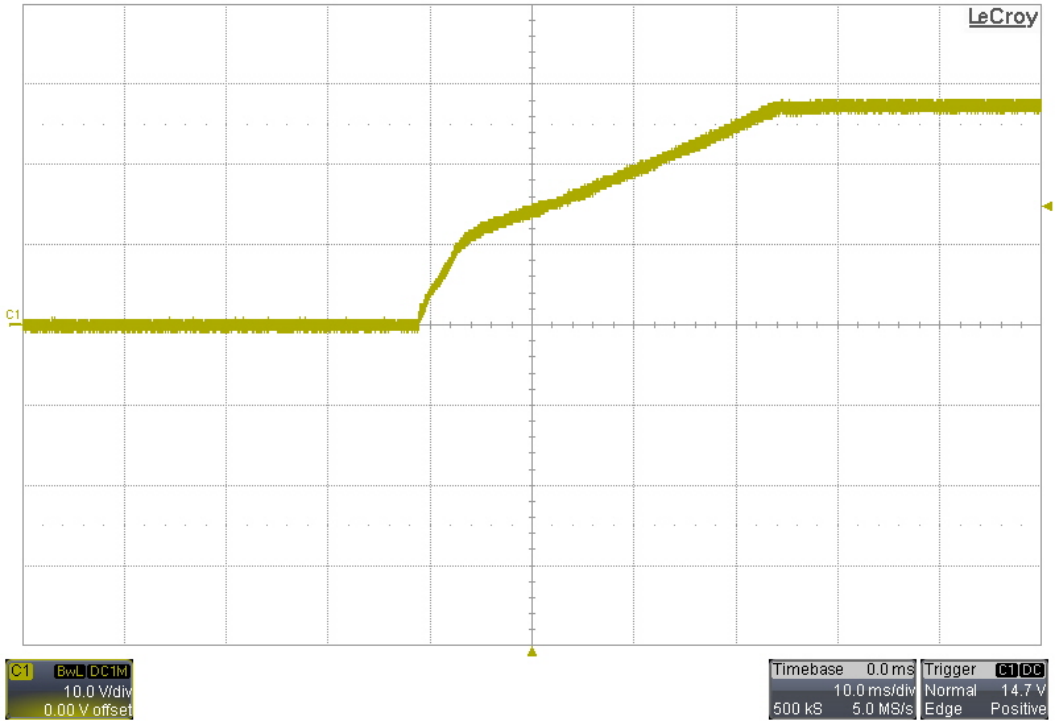
4.1 400VDC Input Startup, No Load



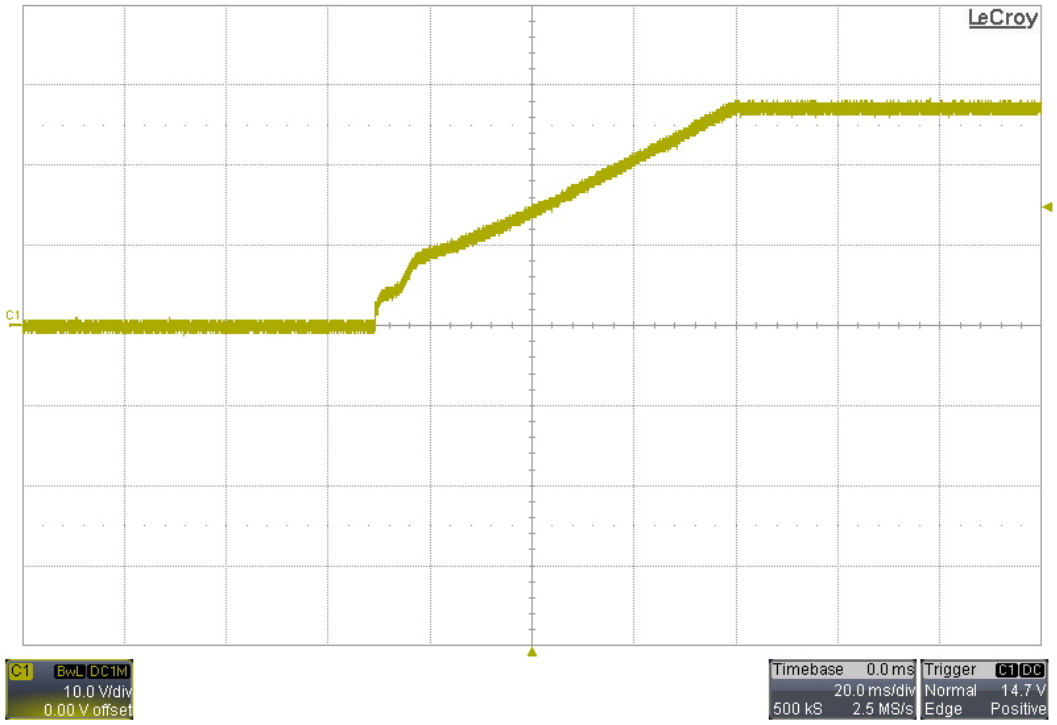
4.2 400VDC Input Startup, 8Ω Load



4.3 250VDC Input Startup, No Load

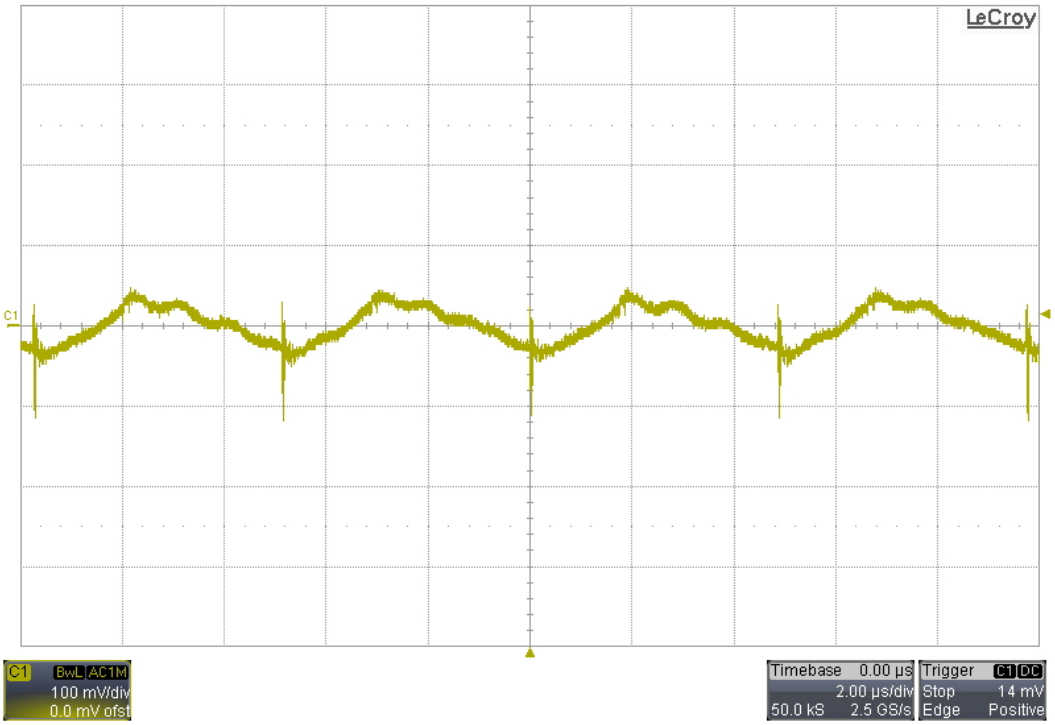


4.4 250VDC Input Startup, 8Ω Load

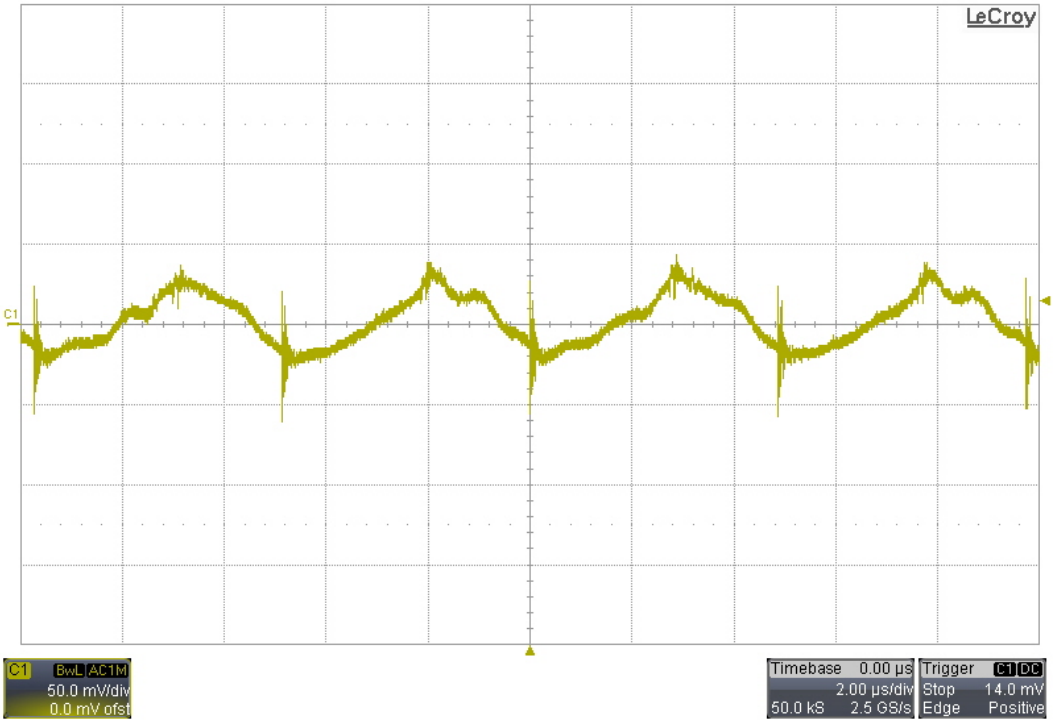


5 Output Ripple Voltage

5.1 400VDC Input, 3.6A Ripple Voltage

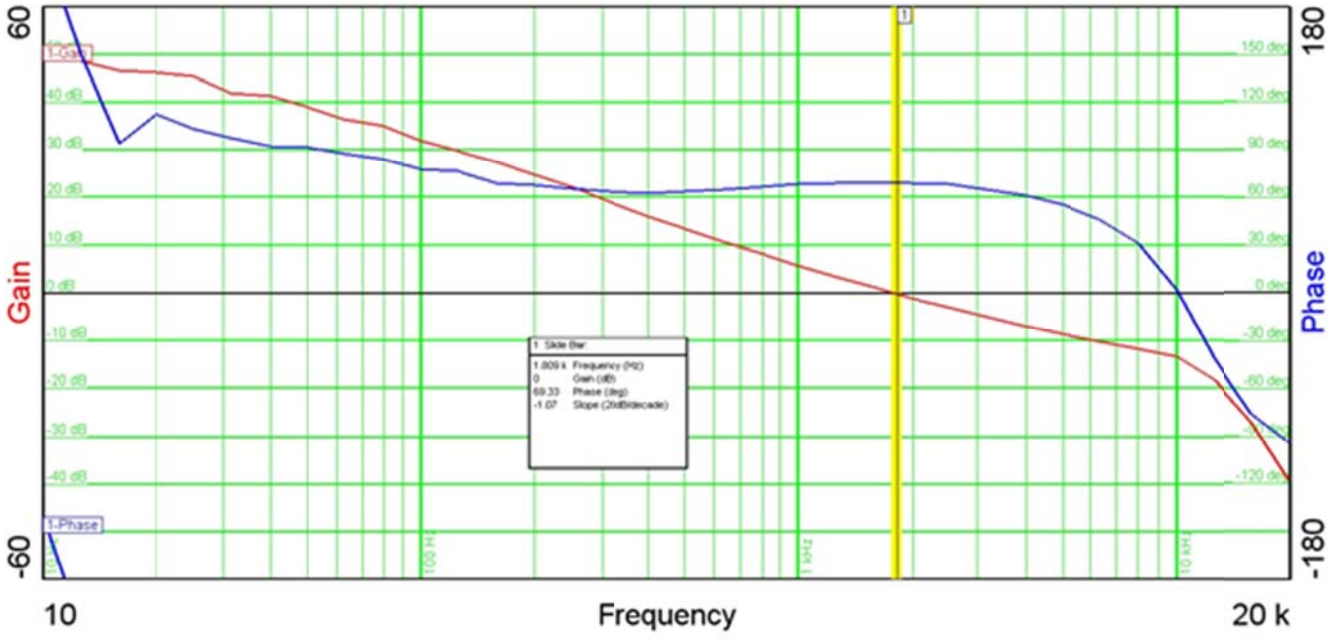


5.2 250VDC Input, 3.6A Ripple Voltage



6 Voltage Loop Response

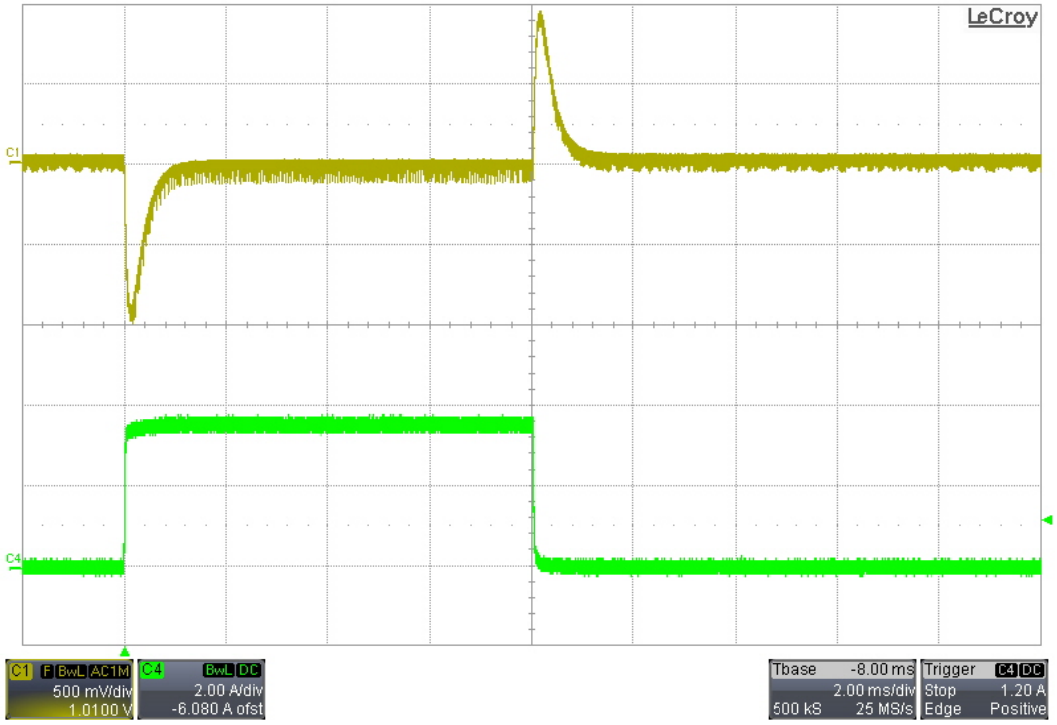
The frequency response of the voltage feedback loop is shown in the image below. The input was 350VDC and the output was loaded with 3.6A.



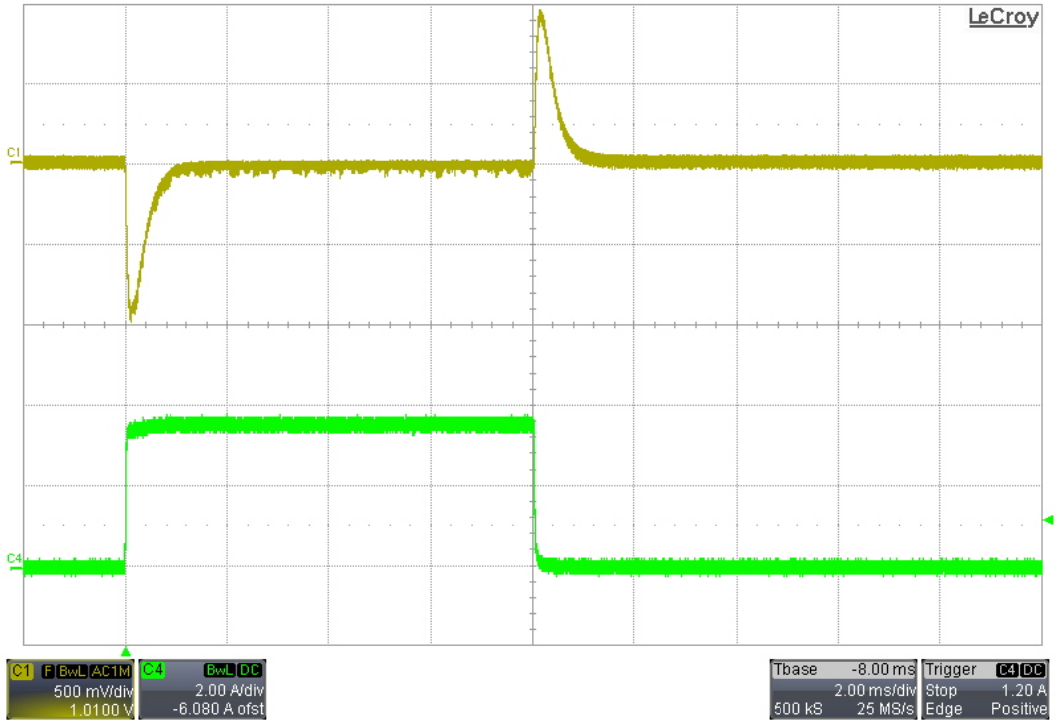
7 Load Transients

The response to a load step from 0A to 3.6A is shown in the images below. Channel 1: Vout (ac coupled); Channel 4: Iout

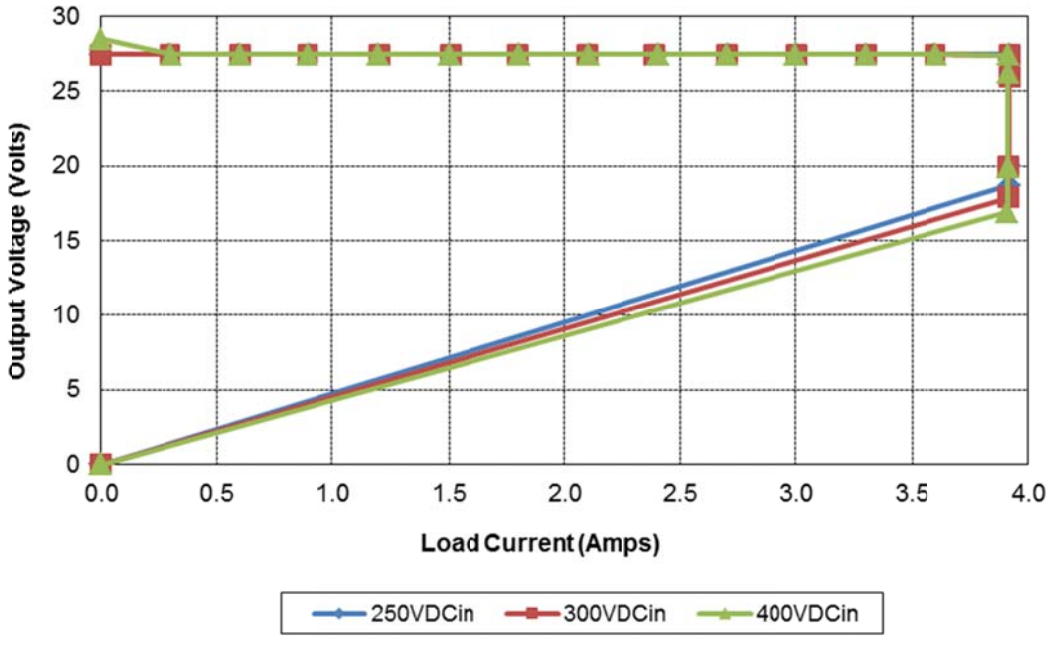
7.1 400VDC Input



7.2 250VDC Input

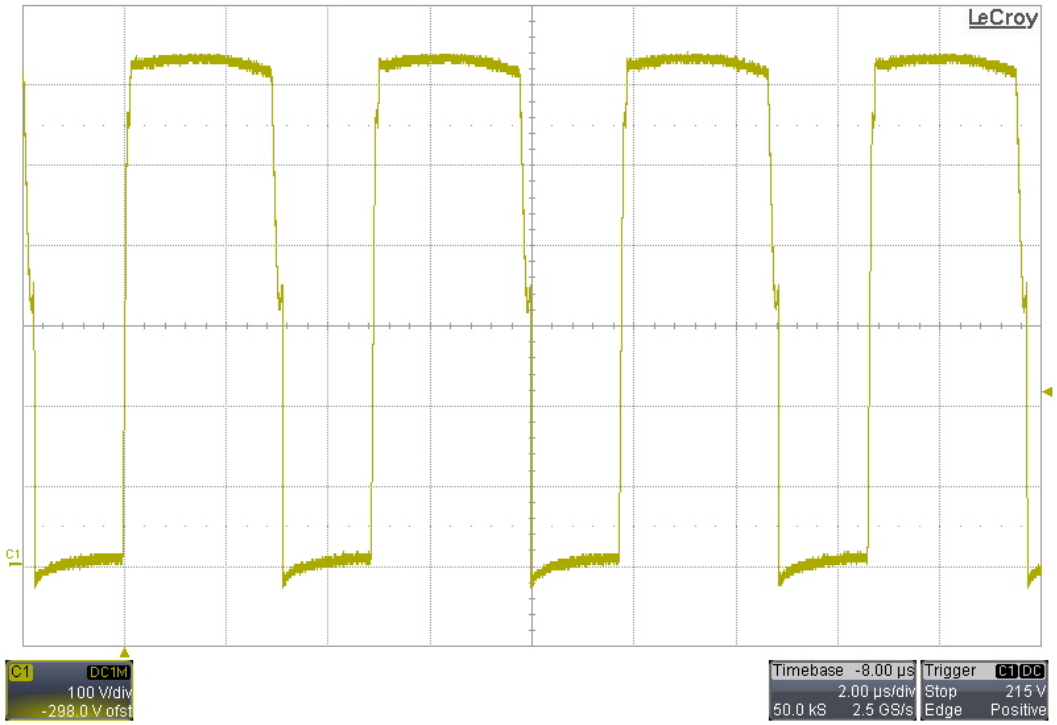


8 Overload V-I Characteristics

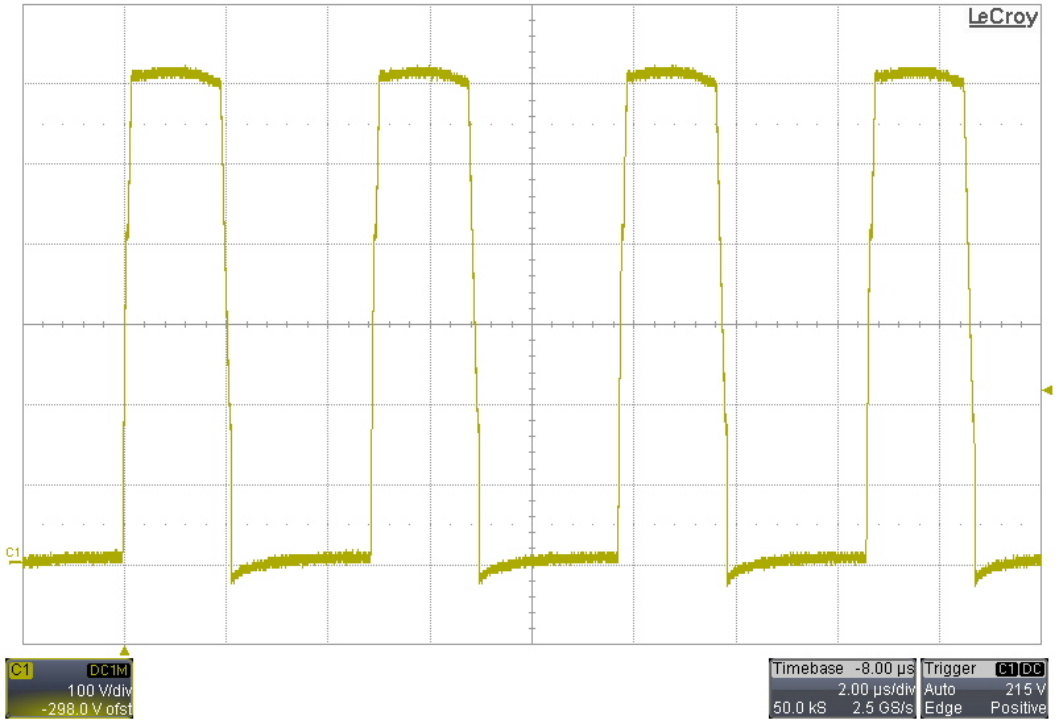


9 Primary Drain Waveforms

9.1 Primary FET (Q9) Vds – 400VDC Input, 3.6A Load

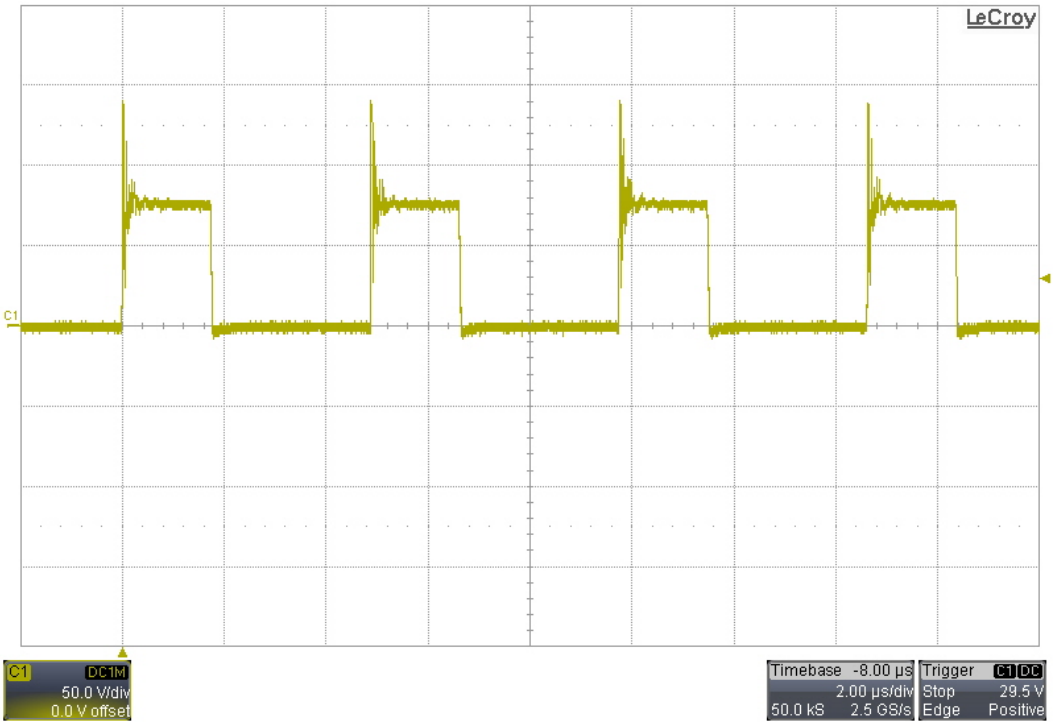


9.2 Primary FET (Q9) Vds – 250VDC Input, 3.6A Load

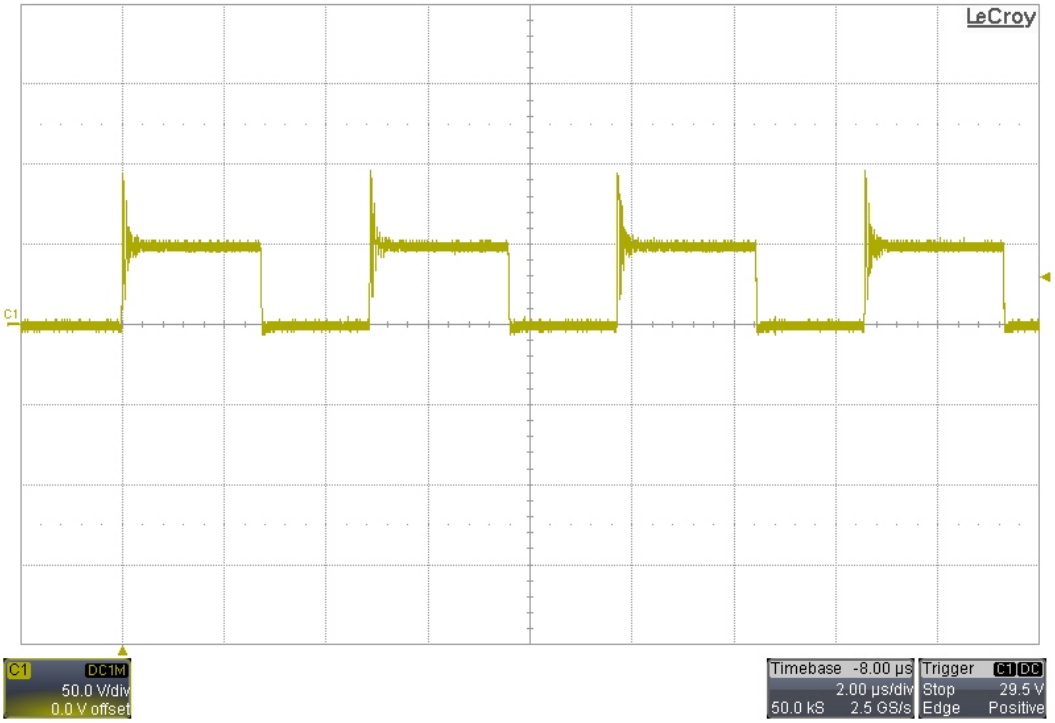


10 Synchronous FET Drain Waveforms

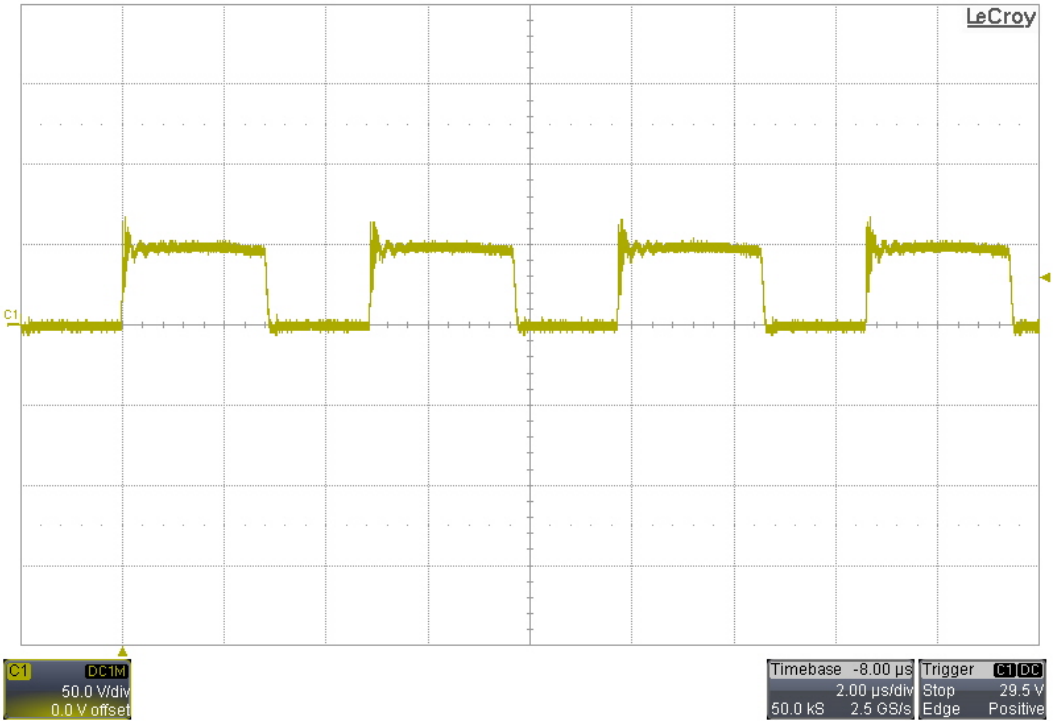
10.1 Q3 Synchronous FET Vds – 400VDC Input, 3.6A Load



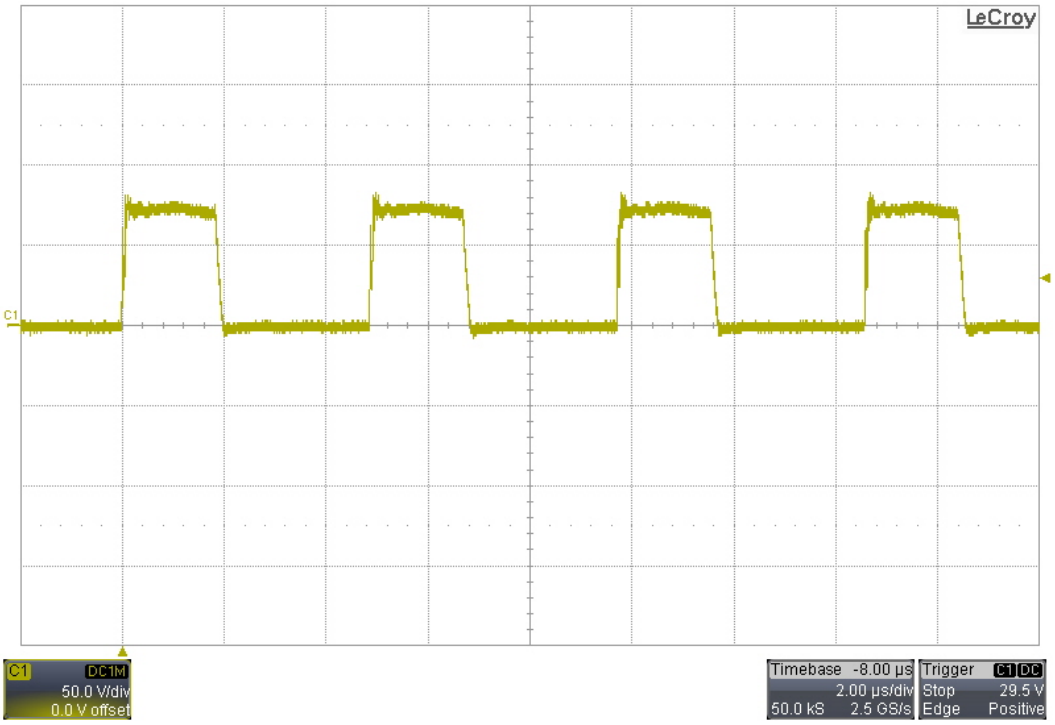
10.2 Q3 Synchronous FET Vds – 250VDC Input, 3.6A Load



10.3 Q10 Synchronous FET Vds – 400VDC Input, 3.6A Load

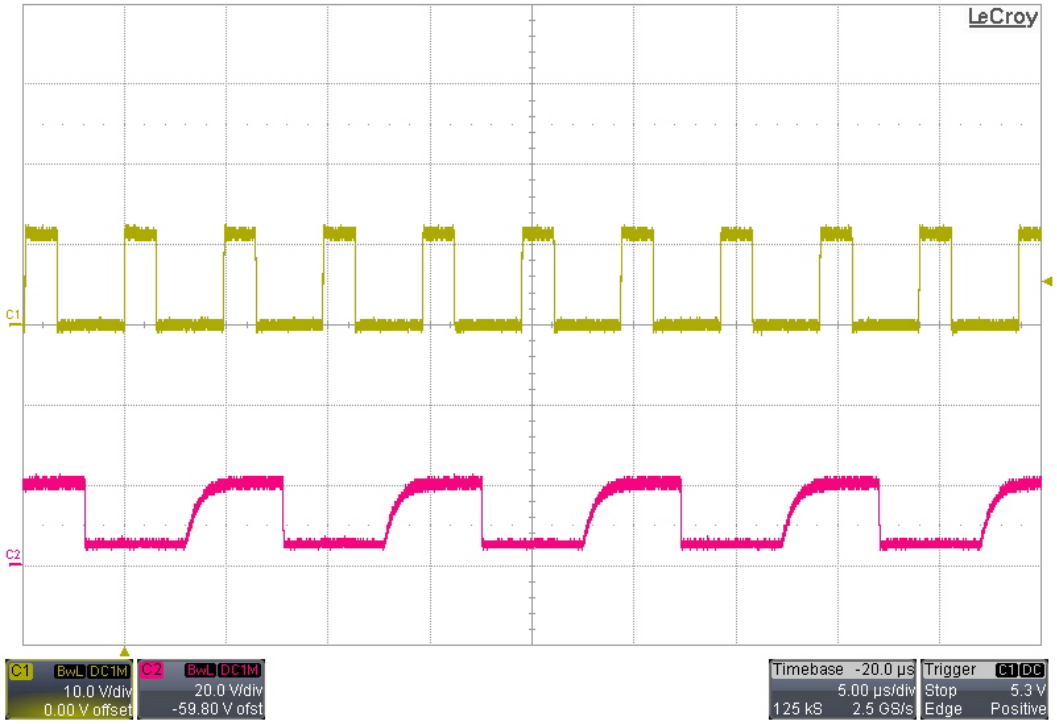


10.4 Q10 Synchronous FET Vds – 250VDC Input, 3.6A Load



11 Synchronization Output

Channel 1 shows the voltage on the gate of the primary FET (Q9). Channel 2 shows the sync output (TP5). The sync output signal was pulled up to an external 20V source through a 30k resistor.



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