PMP6961 Rev E Test Results

1 Photo

The photograph below shows the PMP6961 Rev E demo board.

2 Efficiency

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Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.000	12.08	250.0	0.015	3.75	0.00	3.75	0.0%
0.498	12.08	250.0	0.039	9.75	6.02	3.73	61.7%
1.001	12.08	250.0	0.064	16.00	12.09	3.91	75.6%
1.999	12.08	249.9	0.114	28.49	24.15	4.34	84.8%
2.999	12.08	249.9	0.164	40.98	36.23	4.76	88.4%
3.998	12.08	249.9	0.214	53.48	48.30	5.18	90.3%
4.996	12.08	249.8	0.264	65.95	60.35	5.60	91.5%
6.00	12.08	249.8	0.317	79.19	72.48	6.71	91.5%
7.00	12.08	249.8	0.368	91.93	84.56	7.37	92.0%
8.00	12.08	249.7	0.421	105.12	96.64	8.48	91.9%
8.33	12.08	249.7	0.439	109.62	100.63	8.99	91.8%

Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.000	12.08	300.0	0.013	3.90	0.00	3.90	0.0%
0.501	12.08	300.0	0.034	10.20	6.05	4.15	59.3%
0.999	12.08	300.0	0.054	16.20	12.07	4.13	74.5%
2.001	12.08	300.0	0.096	28.80	24.17	4.63	83.9%
3.002	12.08	299.9	0.138	41.39	36.26	5.12	87.6%
4.002	12.08	299.9	0.180	53.98	48.34	5.64	89.6%
5.000	12.08	299.9	0.222	66.58	60.40	6.18	90.7%
6.00	12.08	299.9	0.265	79.47	72.48	6.99	91.2%
7.00	12.08	299.8	0.308	92.34	84.56	7.78	91.6%
8.00	12.08	299.8	0.351	105.23	96.64	8.59	91.8%
8.33	12.08	299.8	0.366	109.73	100.63	9.10	91.7%

Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.000	12.08	387.4	0.013	5.04	0.00	5.04	0.0%
0.497	12.08	387.4	0.028	10.85	6.00	4.84	55.3%
1.005	12.08	387.4	0.044	17.05	12.14	4.91	71.2%
2.002	12.08	387.4	0.077	29.83	24.18	5.65	81.1%
3.002	12.08	387.4	0.110	42.61	36.26	6.35	85.1%
4.003	12.08	387.3	0.143	55.38	48.36	7.03	87.3%
5.003	12.08	387.3	0.176	68.16	60.44	7.73	88.7%
6.00	12.08	387.3	0.209	80.95	72.48	8.47	89.5%
7.00	12.08	387.3	0.243	94.11	84.56	9.55	89.8%
8.00	12.08	387.3	0.276	106.89	96.64	10.25	90.4%
8.33	12.08	387.3	0.288	111.54	100.63	10.92	90.2%

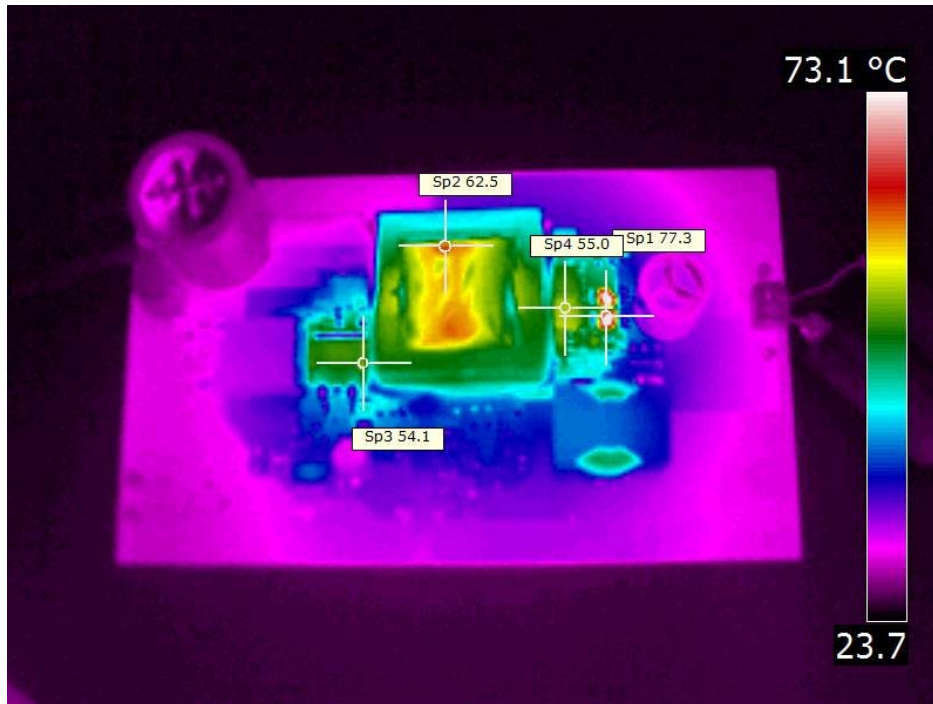Power Management Solutions

3 Thermal Images

The ambient temperature was 25C with 200LFM of forced air flow. The output was loaded with 8.3A.

3.1 400VDC Input
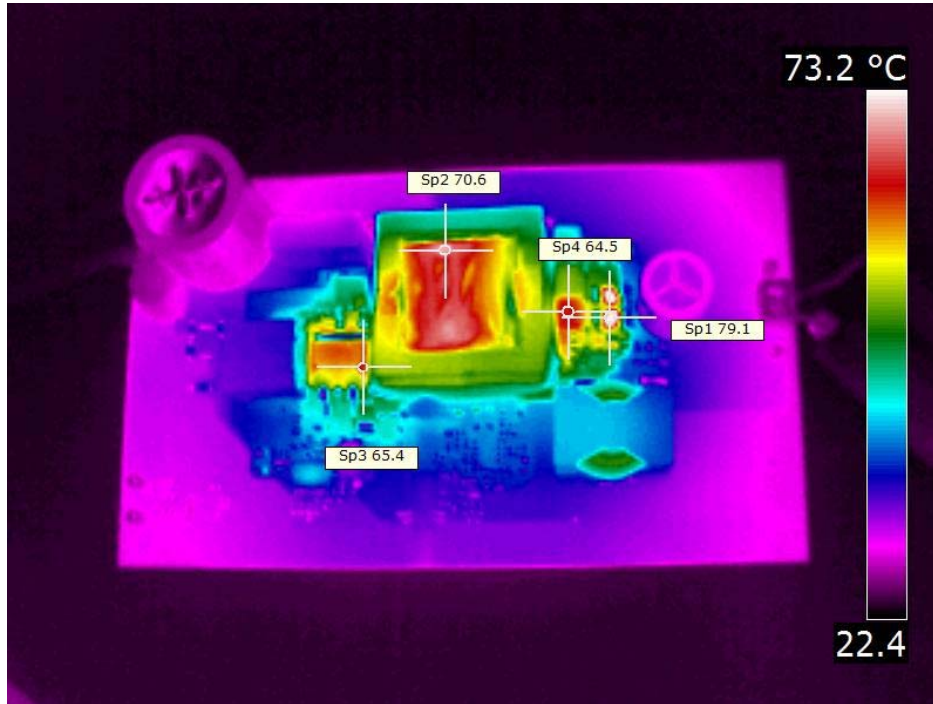
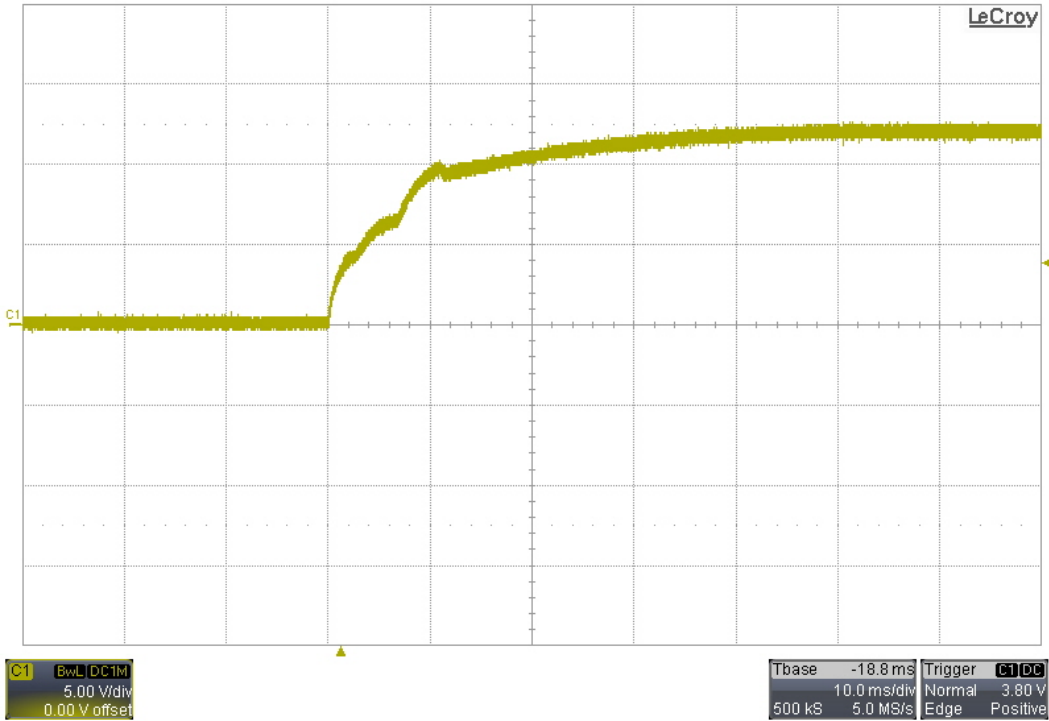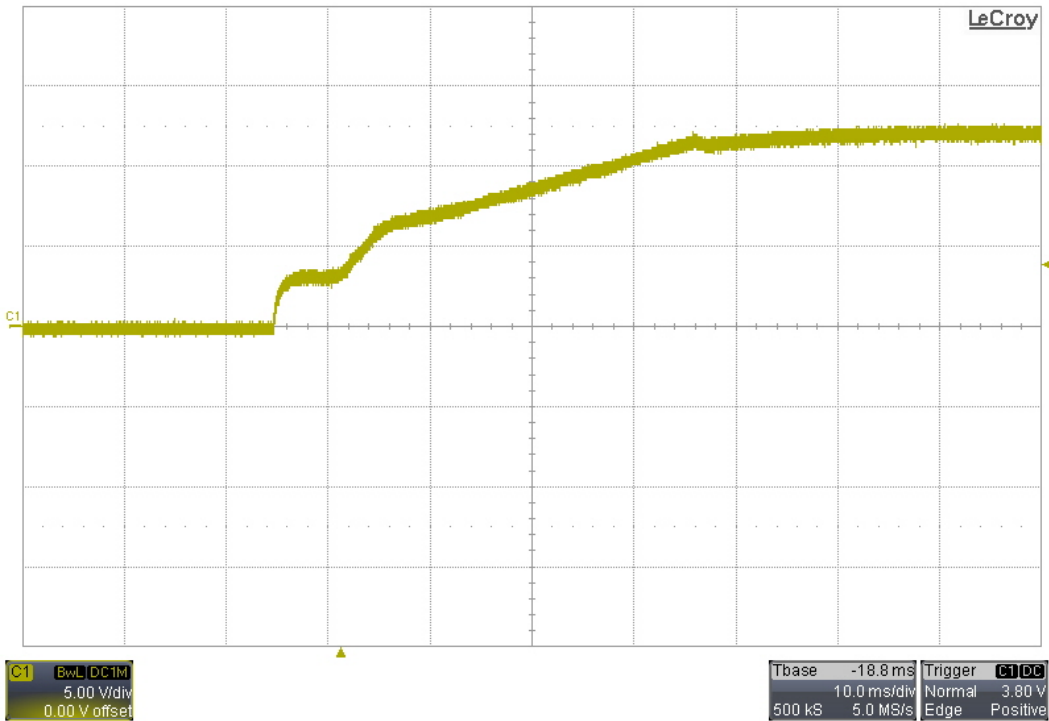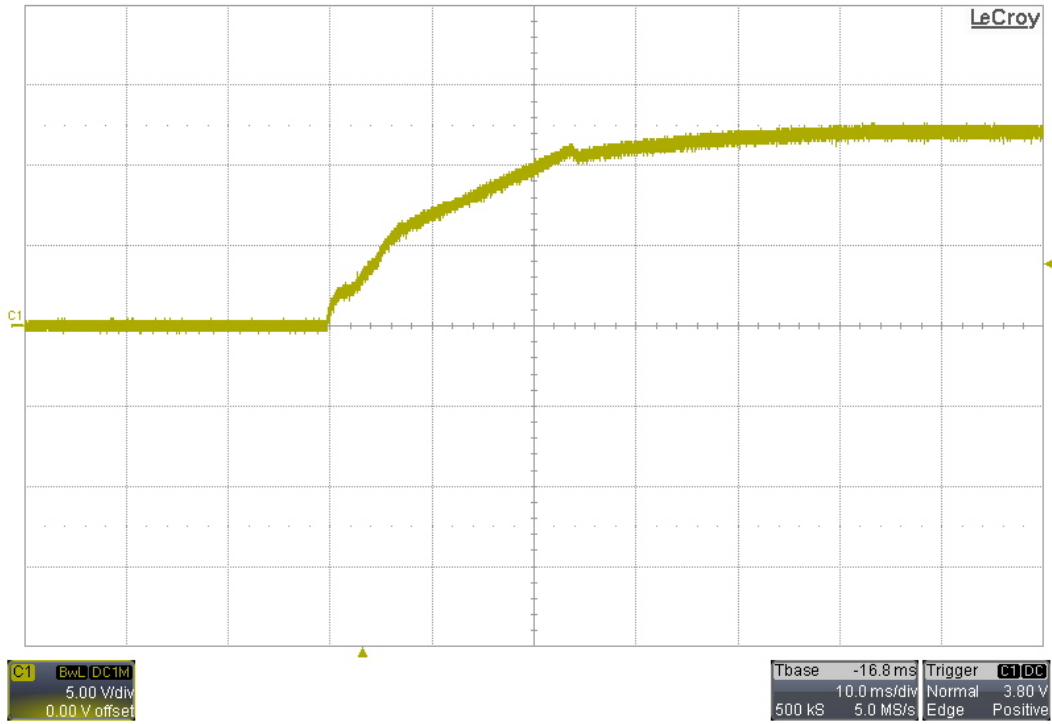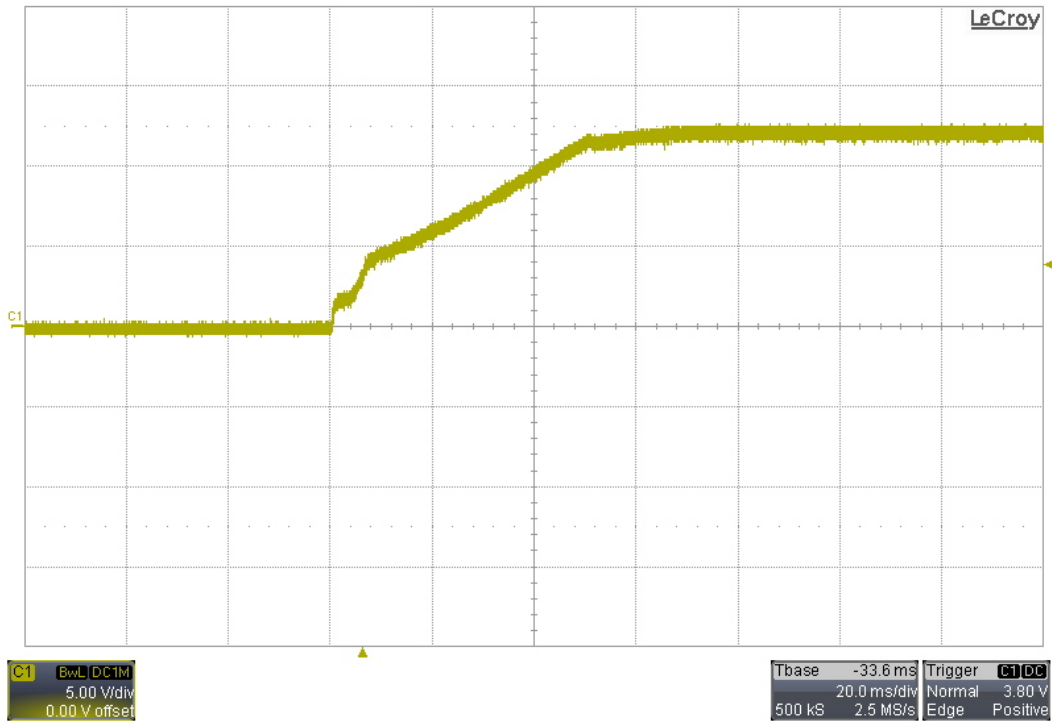### 3.2 250VDC Input

4   Startup

4.1   400VDC Input Startup, No Load

4.2   400VDC Input Startup, 2Ω Load

4.3 250VDC Input Startup, No Load

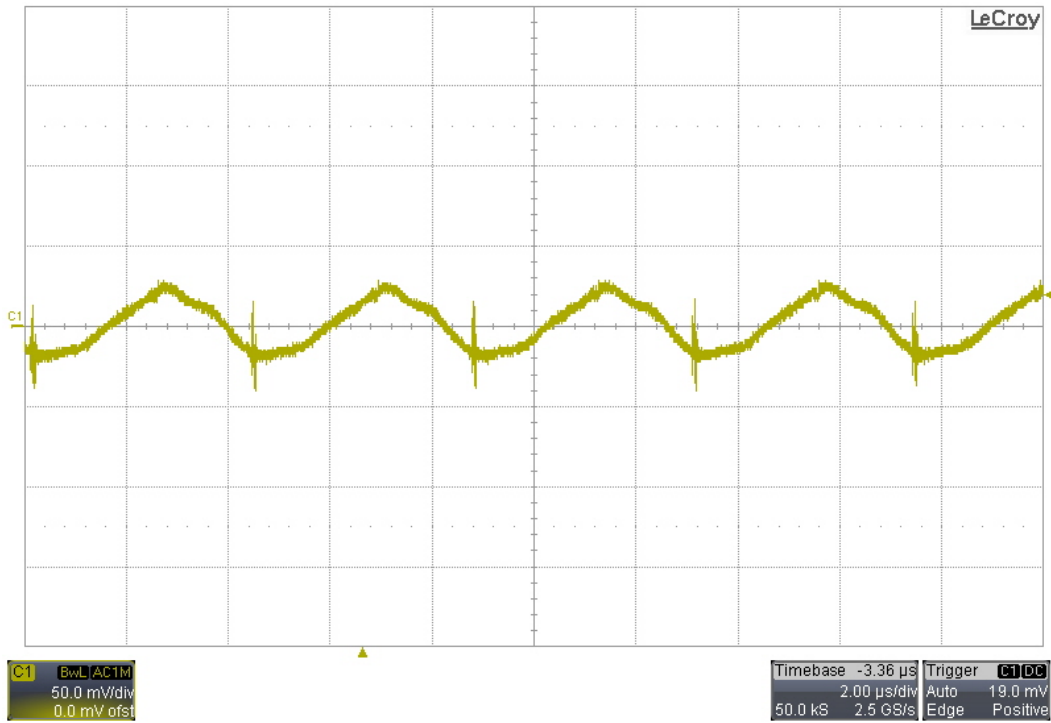### 4.4 250VDC Input Startup, 2Ω Load

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5 Output Ripple Voltage

5.1 400VDC Input, 8.3A Ripple Voltage
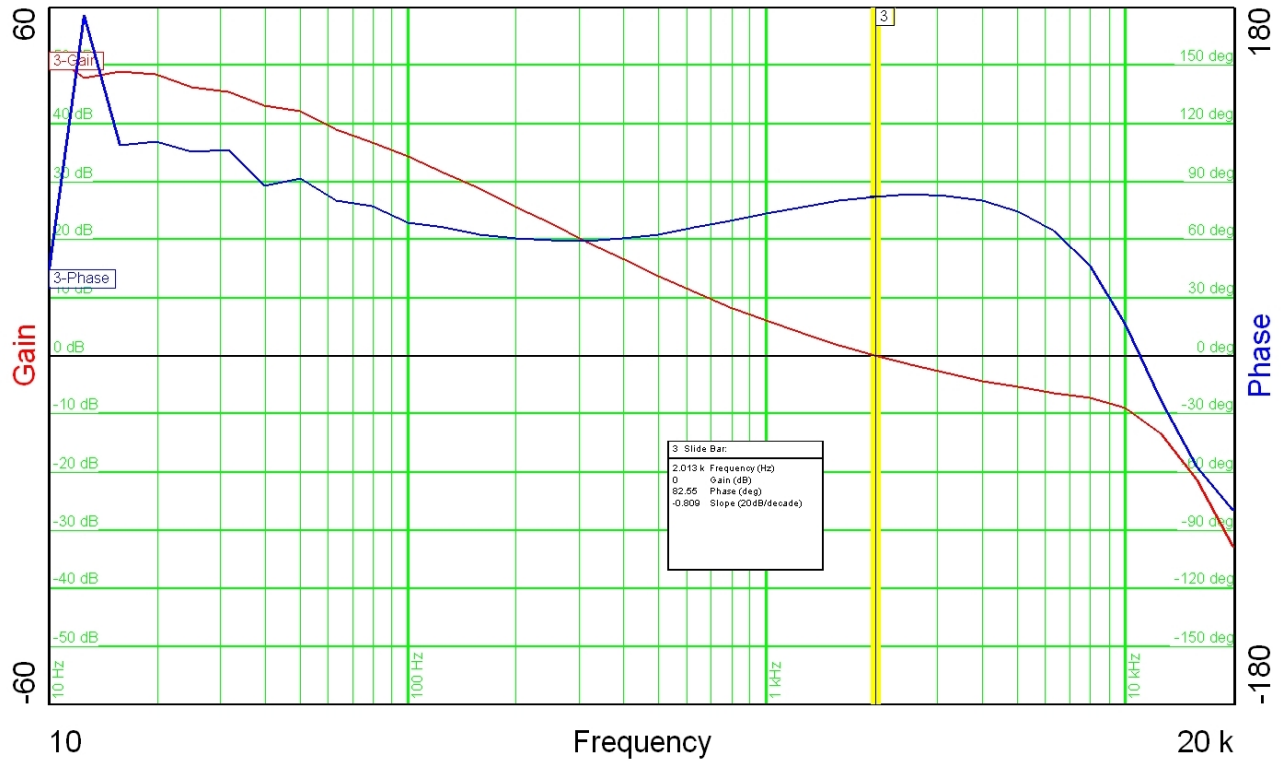

5.2 250VDC Input, 8.3A Ripple Voltage

Power Management Solutions
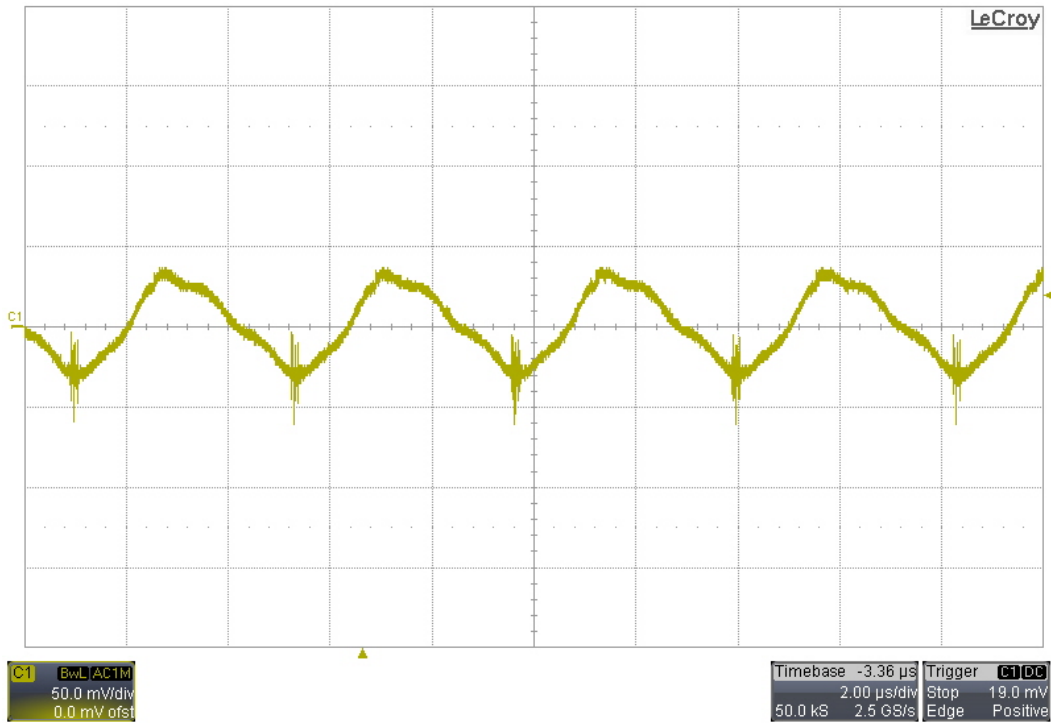
6   Voltage Loop Response

The frequency response of the voltage feedback loop is shown in the image below. The input was 350VDC and the output was loaded with 8.3A.
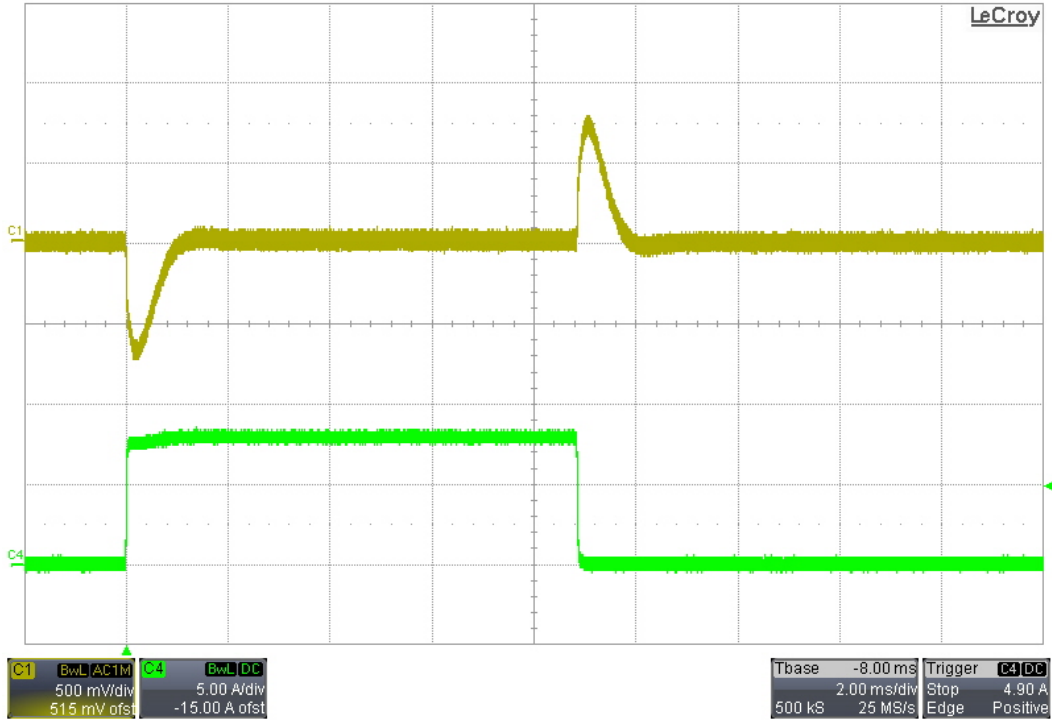
7 Current Loop Response

The frequency response of the over current feedback loop is shown in the image below. The input was 350VDC and the output was loaded until the output was current-regulated.
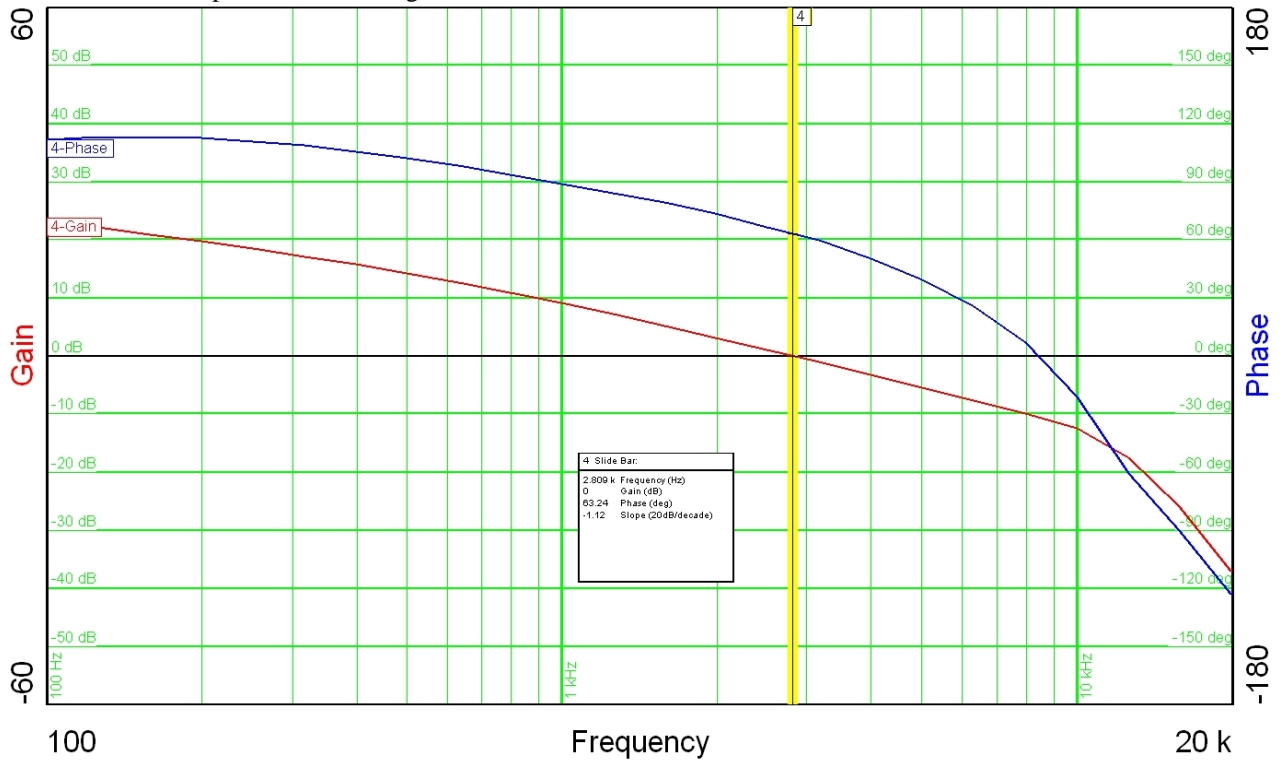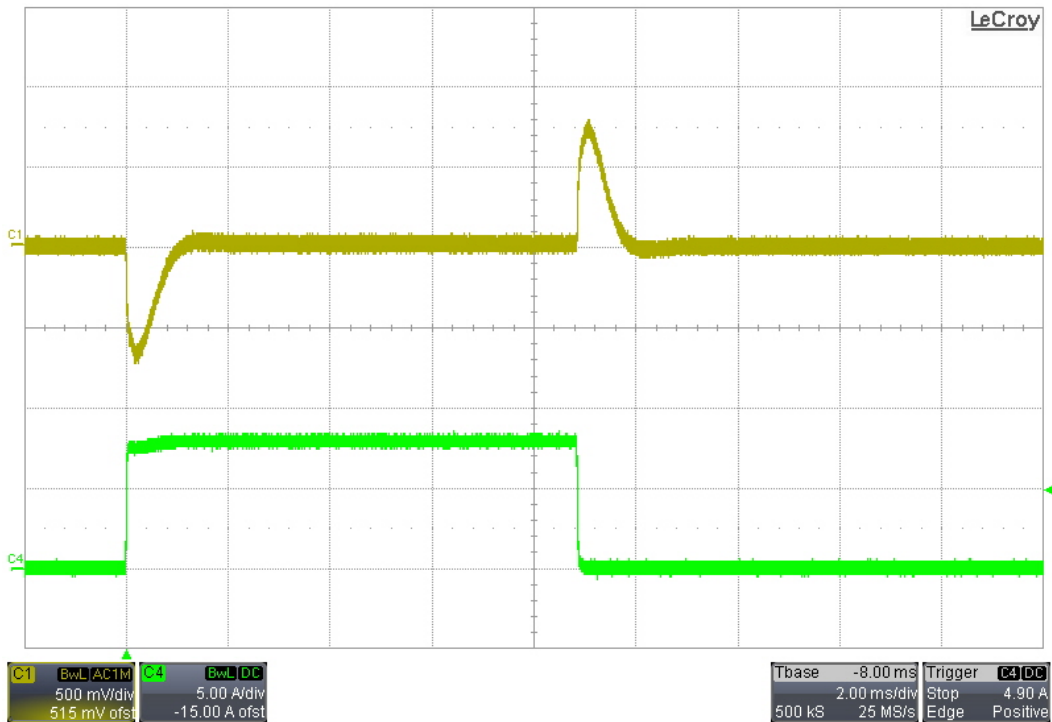
8   Load Transients

The response to a load step from 0A to 8A is shown in the images below. Channel 1: Vout (ac coupled); Channel 4: Iout
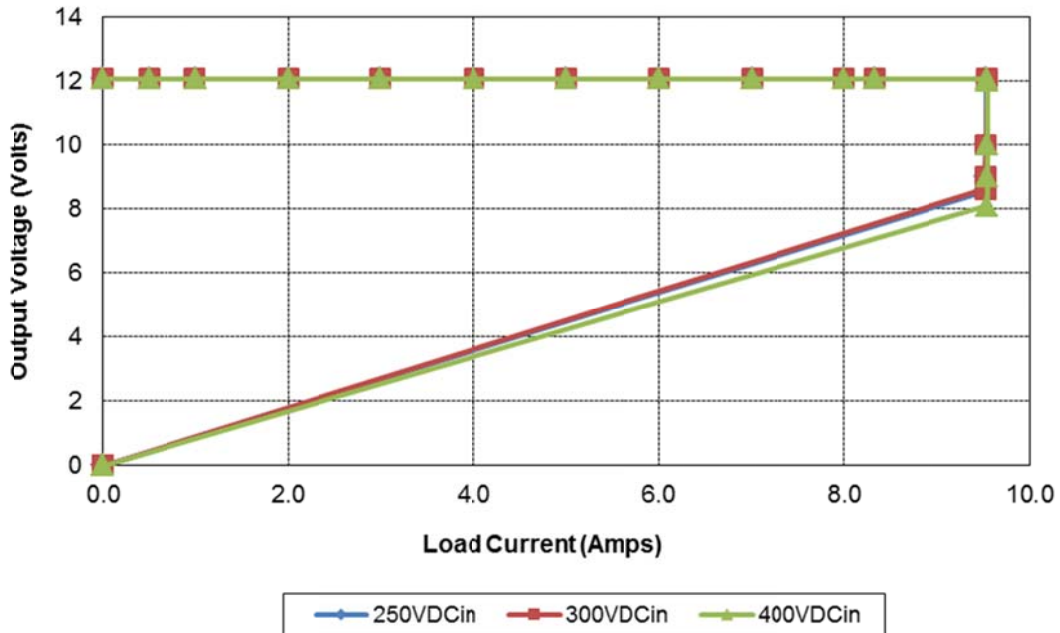
8.1   400VDC Input

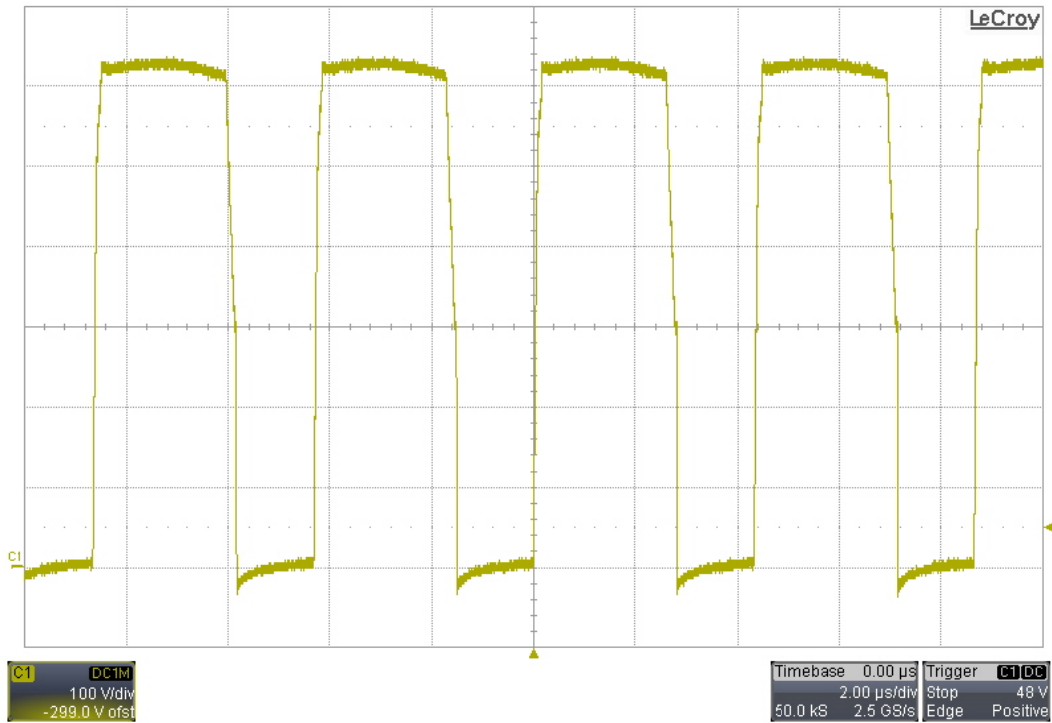### 8.2   250VDC Input
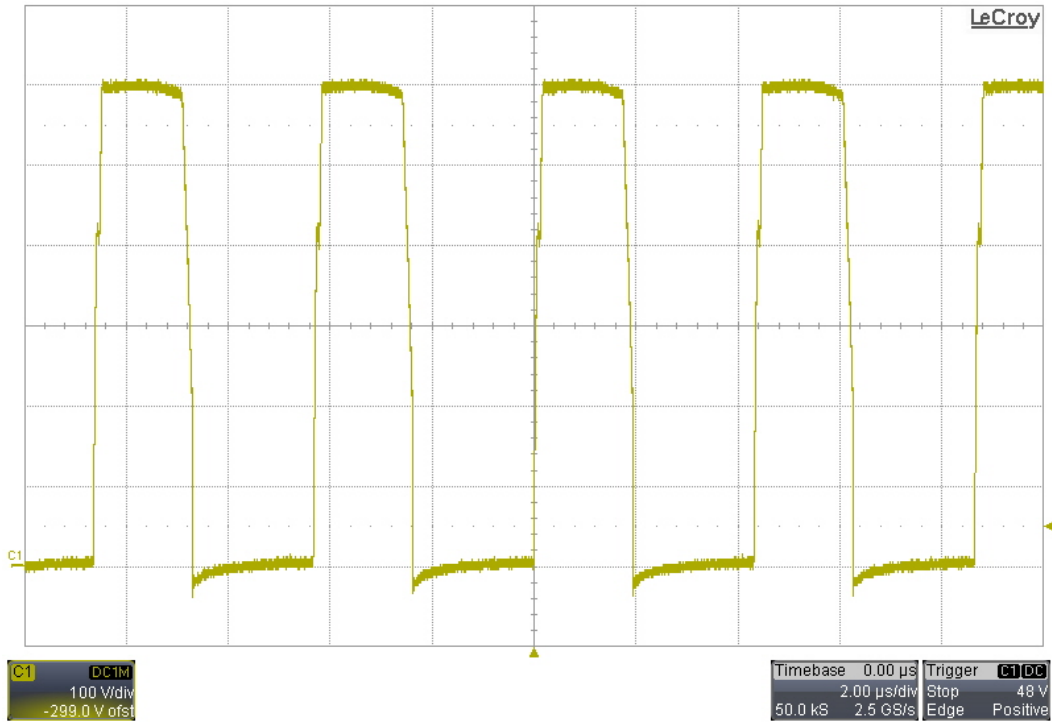
9 Overload V-I Characteristics

10 Primary Drain Waveforms

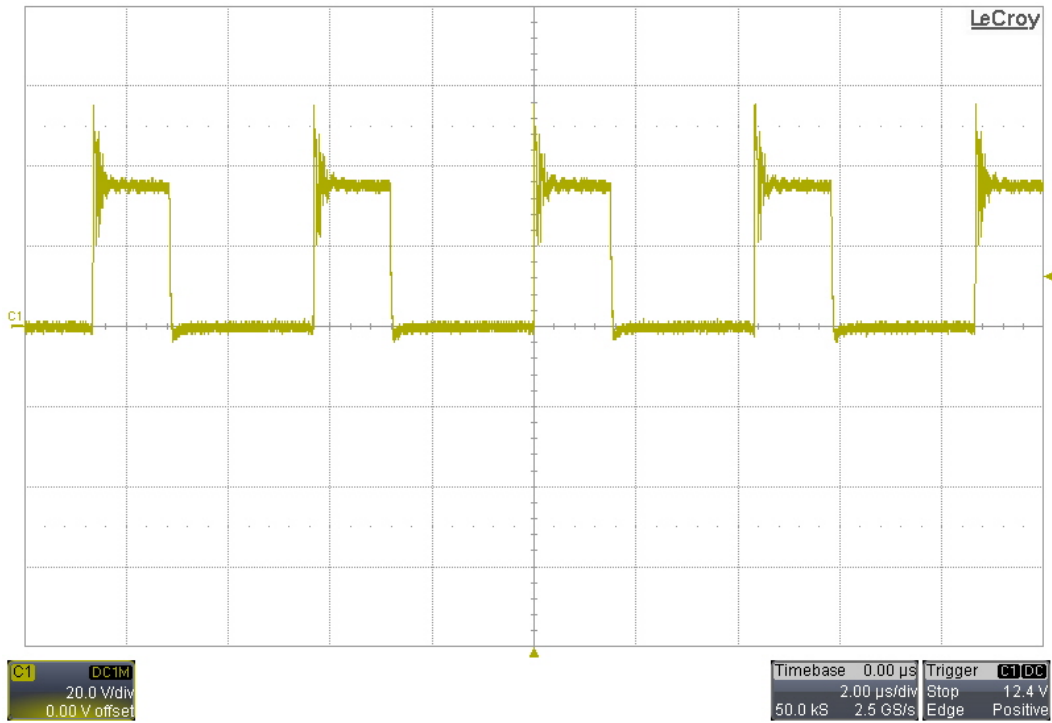## 10.1 Primary FET (Q9) Vds – 400VDC Input, 8.3A Load
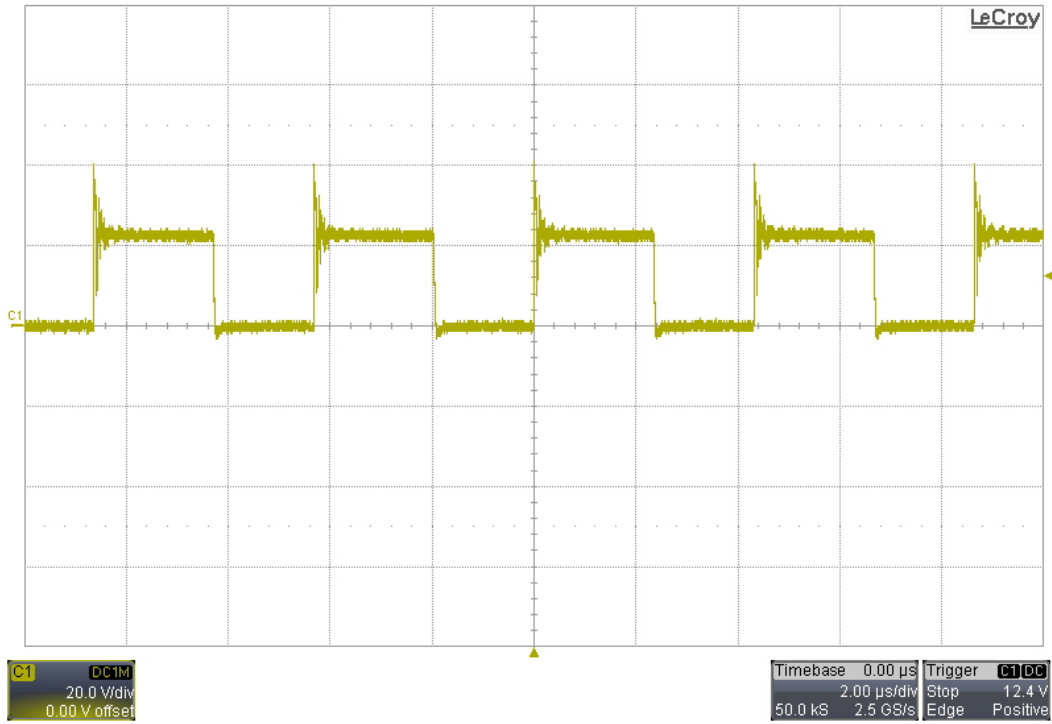
10.2 Primary FET (Q9) Vds – 250VDC Input, 8.3A Load
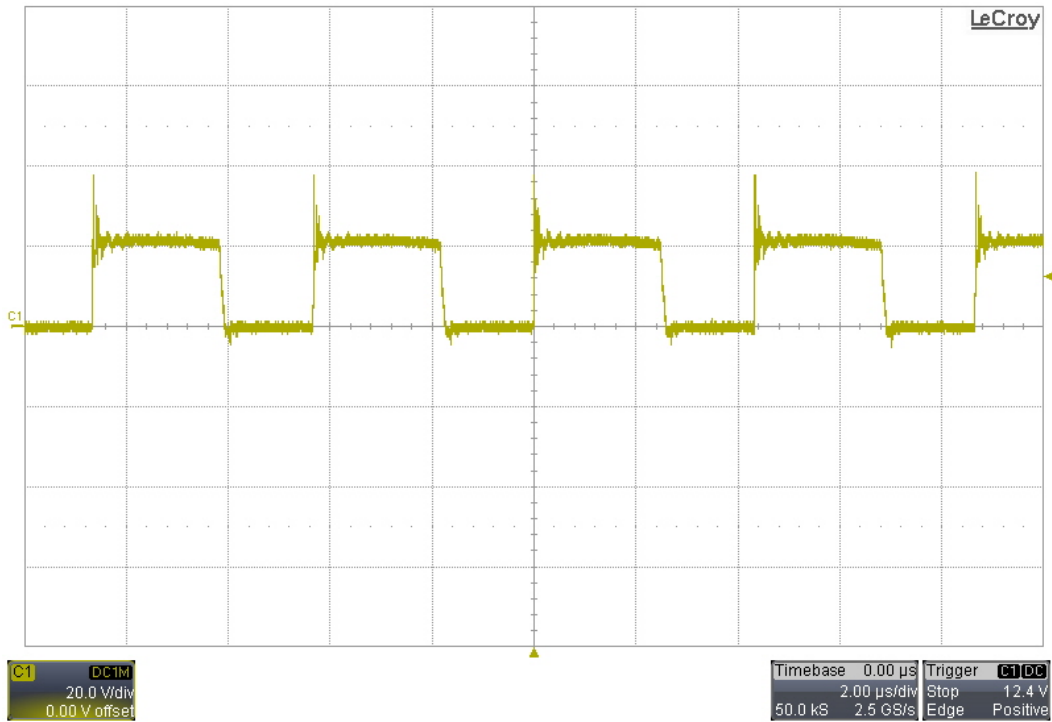

11 Synchronous FET Drain Waveforms

11.1 Q3 Synchronous FET Vds – 400VDC Input, 8.3A Load
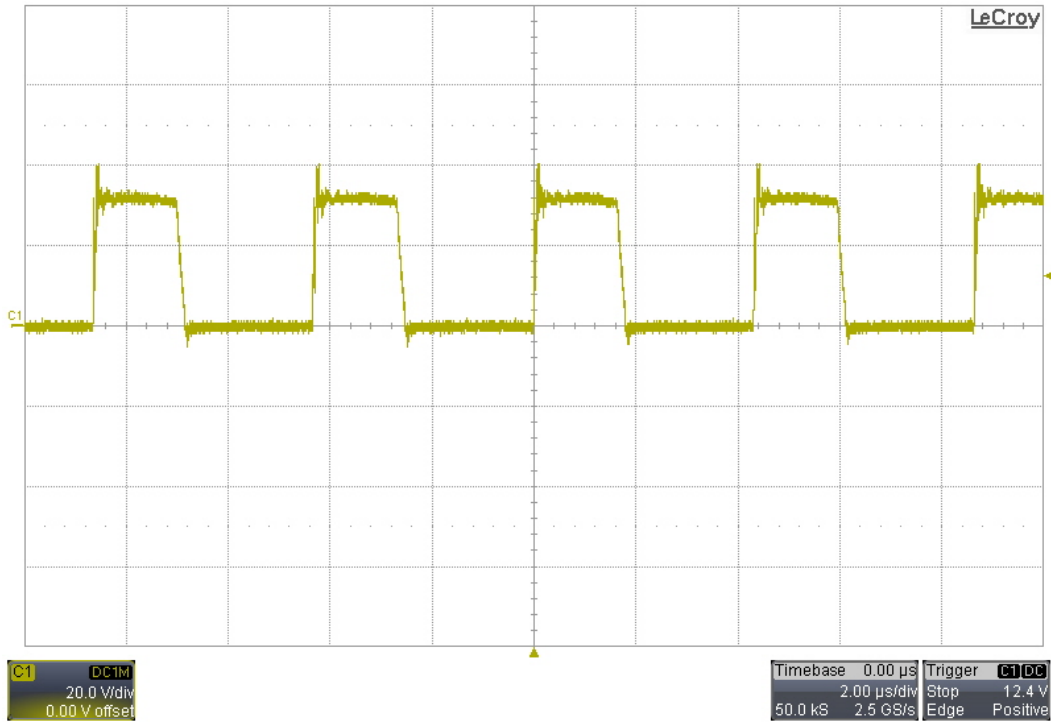

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11.2 Q3 Synchronous FET Vds – 250VDC Input, 8.3A Load

11.3 Q10 Synchronous FET Vds – 400VDC Input, 8.3A Load
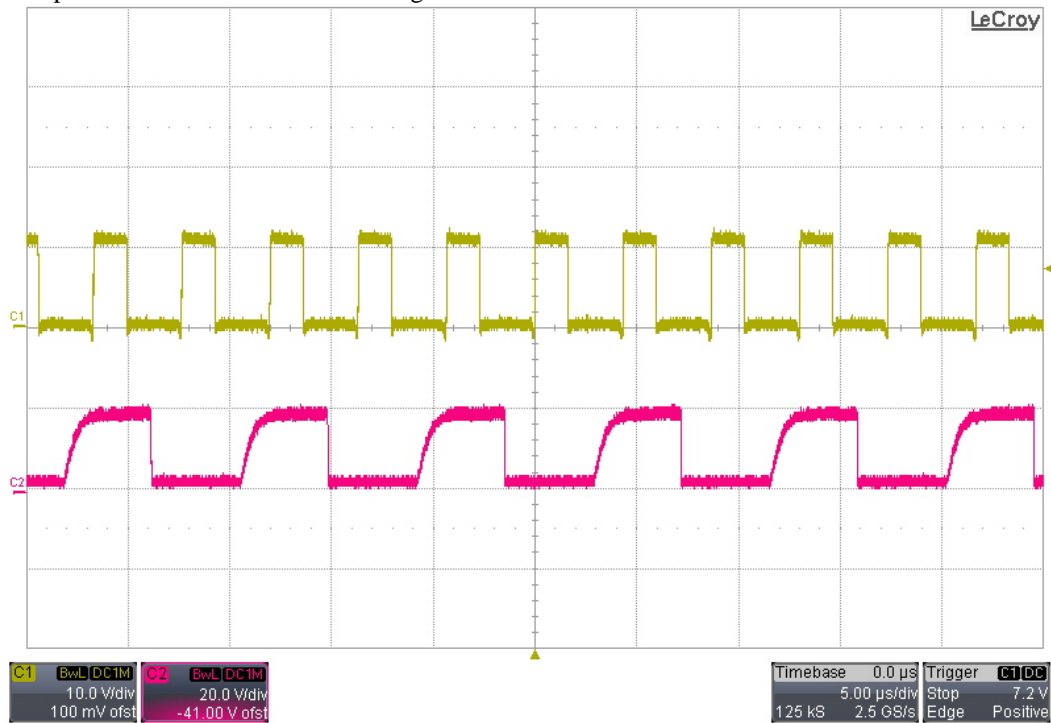
11.4 Q10 Synchronous FET Vds – 250VDC Input, 8.3A Load

12 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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