PMP20172 Rev E

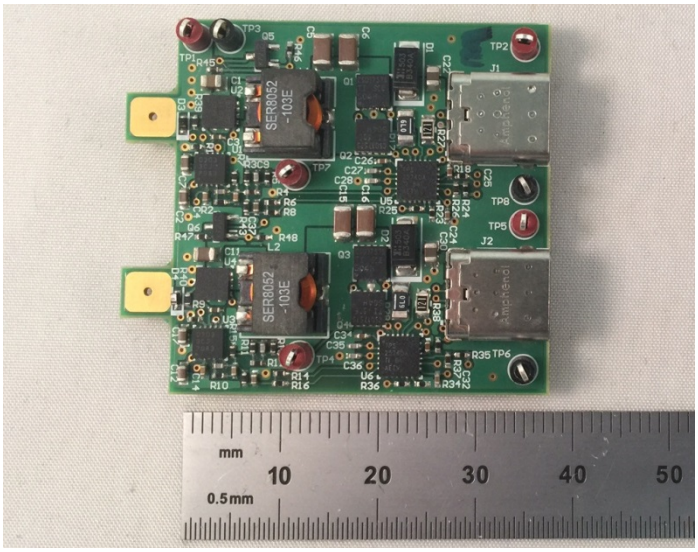
36W USB Dual Port USB Type C PD with Port Power Management DC/DC Charger

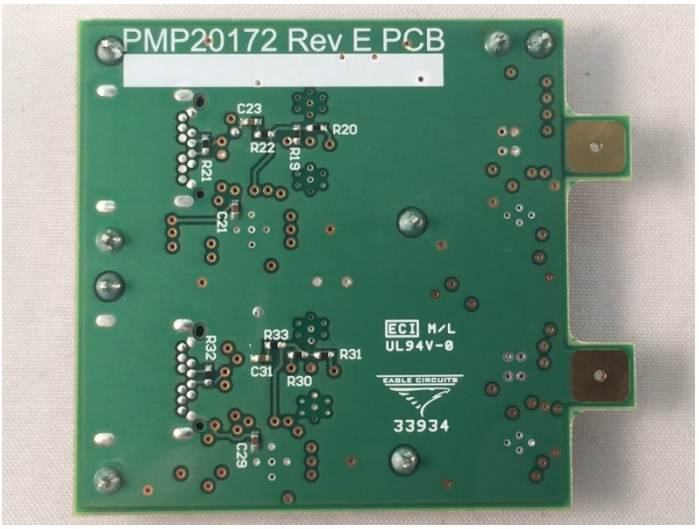
Test Results

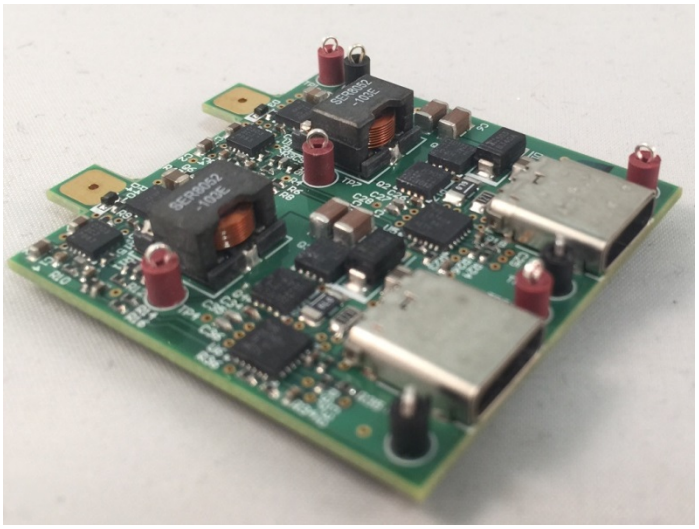
Contents

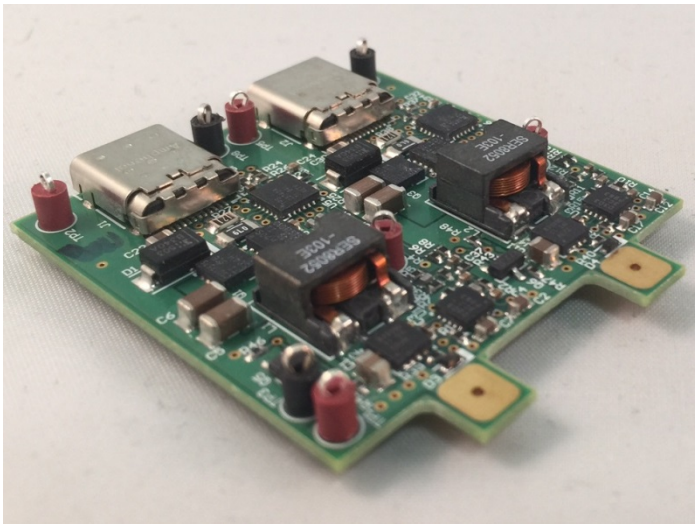
1 Photos

The photographs below show the PMP20172 Rev E prototype assembly.









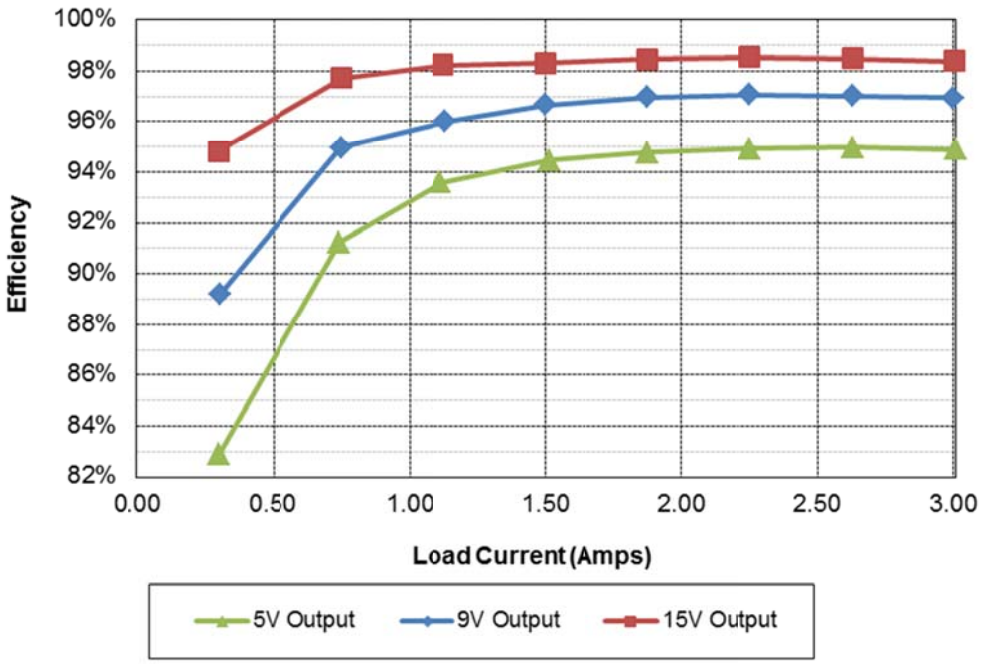
2 Standby Power (Cables Unplugged)

Input Voltage	Input Power
17V	12.9 mW

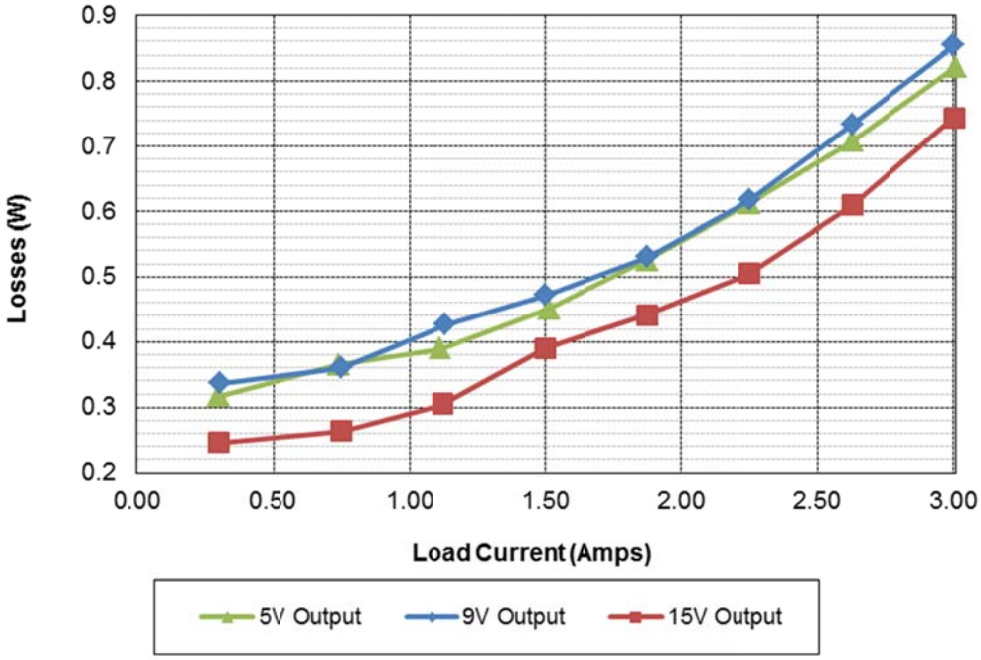
3 Efficiency

Efficiency was measured on a single port only. Un-used port was left open.

3.1 Efficiency Chart



3.2 Power Loss Chart



3.3 Raw Data

5V Output

Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.011	5.105	17.00	0.021	0.357	0.06	0.30	15.7%
0.301	5.101	16.99	0.109	1.852	1.54	0.32	82.9%
0.744	5.095	16.96	0.245	4.155	3.79	0.36	91.2%
1.115	5.091	16.99	0.357	6.065	5.68	0.39	93.6%
1.516	5.085	17.00	0.480	8.160	7.71	0.45	94.5%
1.875	5.081	16.98	0.592	10.05	9.53	0.53	94.8%
2.252	5.076	17.01	0.708	12.04	11.43	0.61	94.9%
2.628	5.071	16.99	0.826	14.03	13.33	0.71	95.0%
3.010	5.066	16.97	0.947	16.07	15.25	0.82	94.9%

9V Output

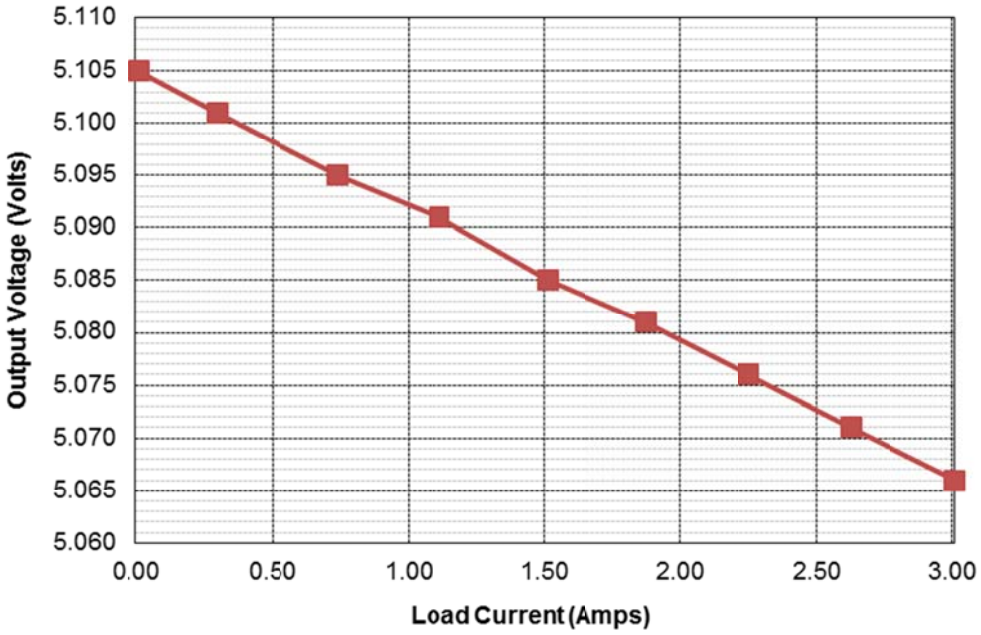
Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.011	9.079	17.00	0.026	0.442	0.10	0.34	22.6%
0.307	9.075	16.97	0.184	3.122	2.79	0.34	89.2%
0.750	9.069	17.01	0.421	7.161	6.80	0.36	95.0%
1.134	9.064	17.02	0.629	10.706	10.28	0.43	96.0%
1.501	9.058	17.01	0.827	14.067	13.60	0.47	96.7%
1.876	9.053	17.02	1.029	17.51	16.98	0.53	97.0%
2.250	9.048	16.97	1.236	20.97	20.36	0.62	97.1%
2.631	9.043	17.02	1.441	24.53	23.79	0.73	97.0%
3.002	9.037	16.97	1.649	27.98	27.13	0.85	96.9%

15V Output

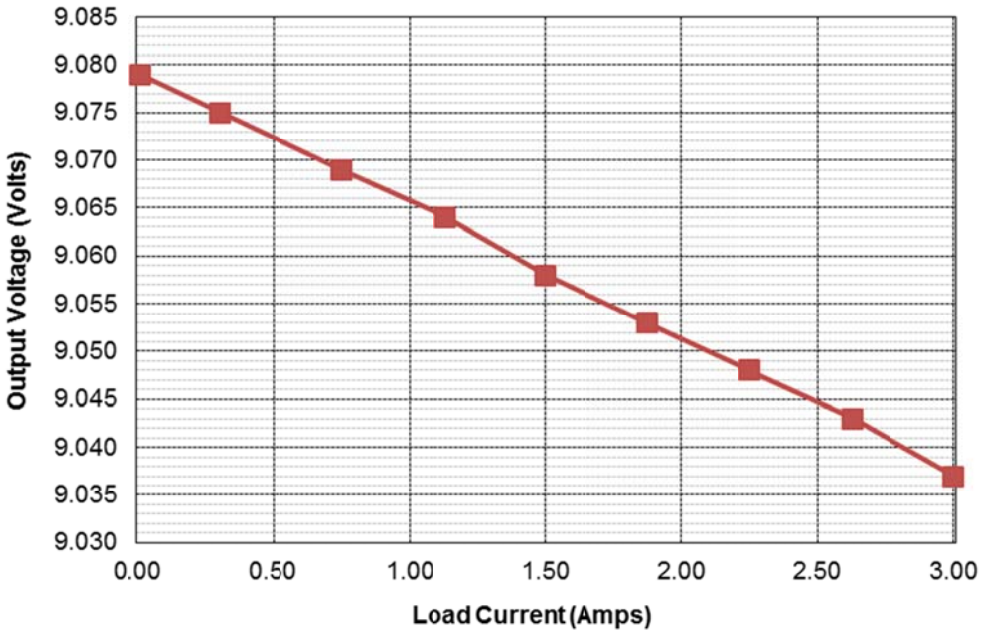
Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.012	15.09	17.00	0.024	0.408	0.18	0.23	44.4%
0.298	15.09	16.94	0.280	4.743	4.50	0.25	94.8%
0.752	15.08	16.99	0.683	11.604	11.34	0.26	97.7%
1.125	15.07	16.92	1.020	17.258	16.95	0.30	98.2%
1.500	15.06	17.01	1.351	22.981	22.59	0.39	98.3%
1.875	15.06	17.00	1.687	28.68	28.24	0.44	98.5%
2.252	15.05	17.02	2.021	34.40	33.89	0.50	98.5%
2.628	15.05	17.01	2.361	40.16	39.55	0.61	98.5%
3.004	15.04	16.99	2.703	45.92	45.18	0.74	98.4%

4 Regulation

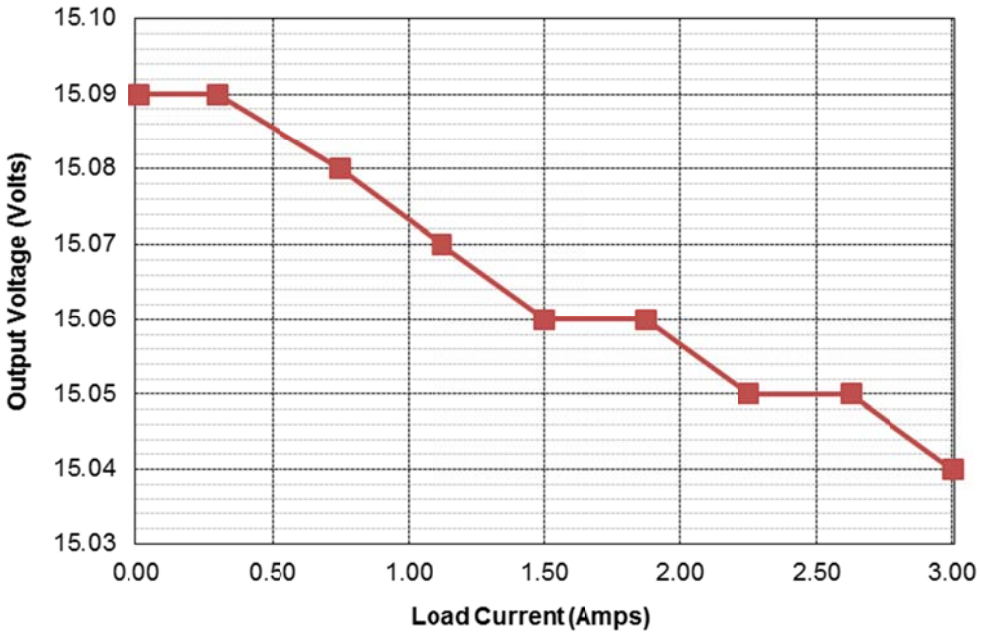
4.1 5V Output



4.2 9V Output

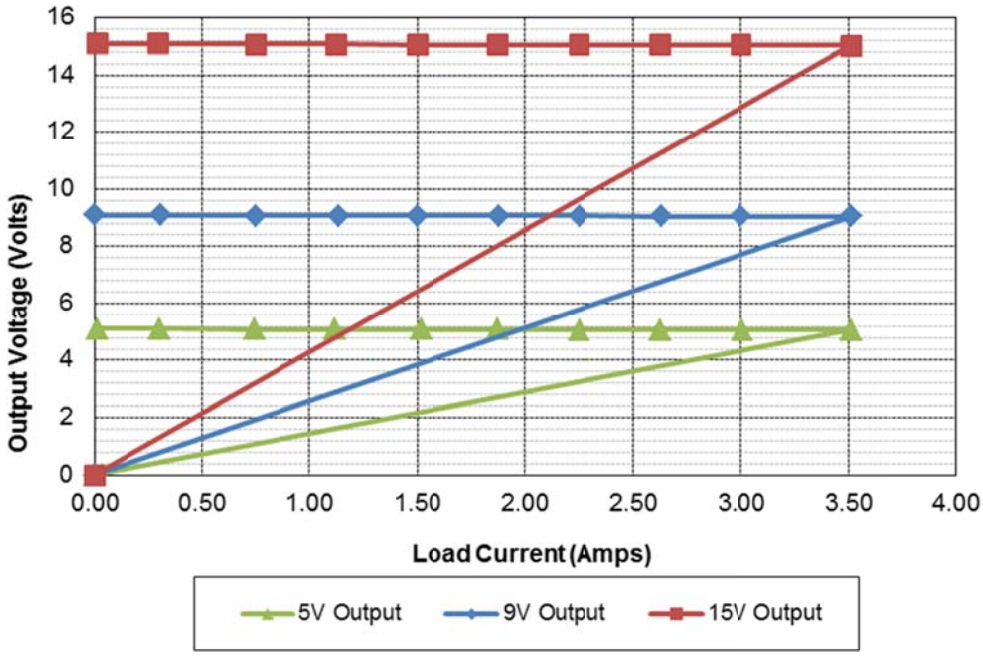


4.3 15V Output



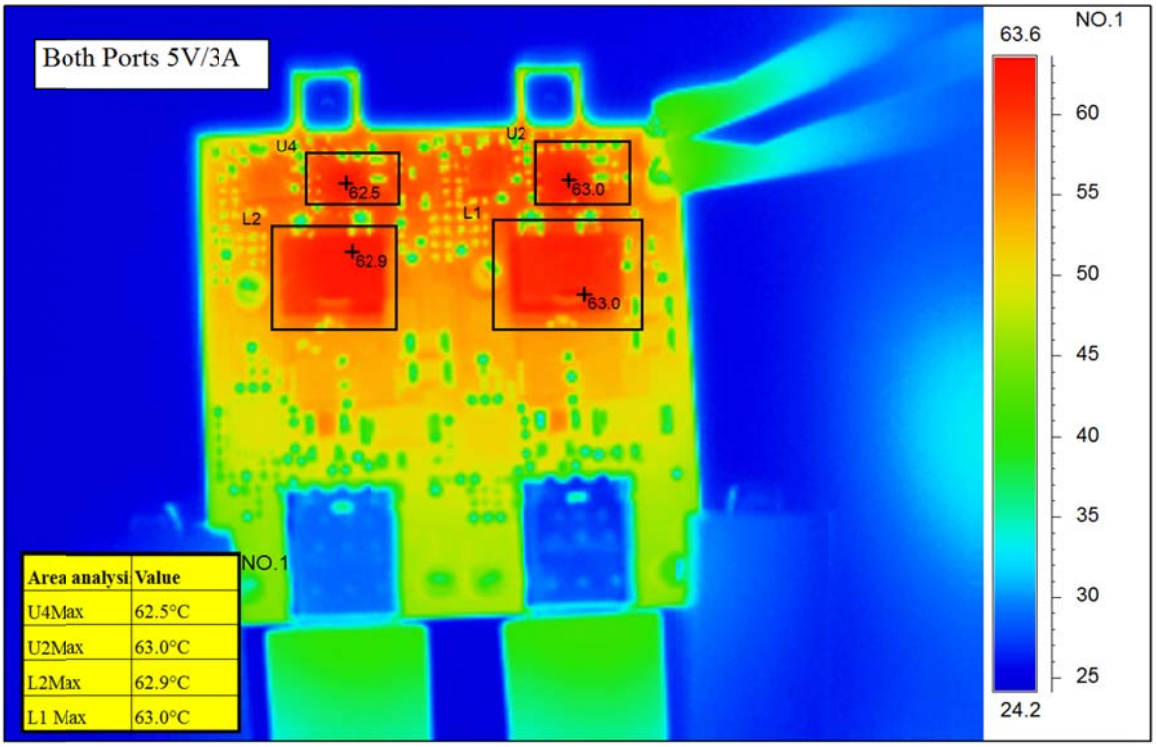
5 Current Limit

The plot below shows the output voltage on TP2/TP8 versus output current as the load is increased into current limit.

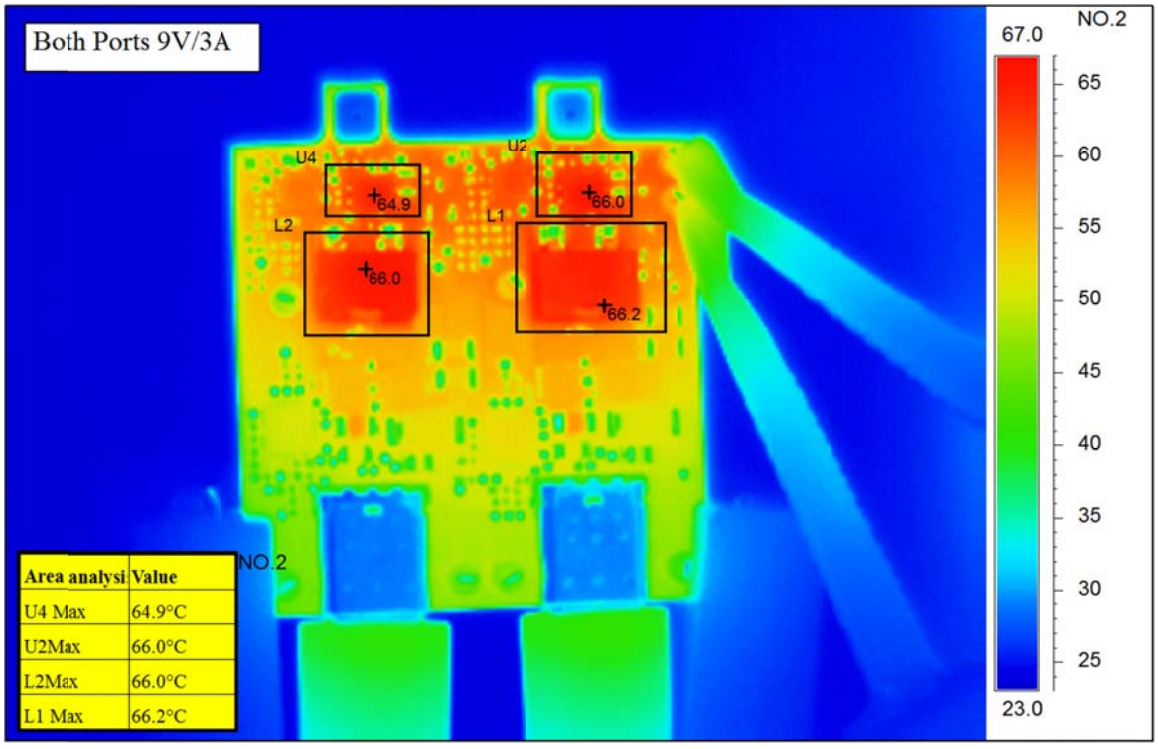


6 Thermal Images

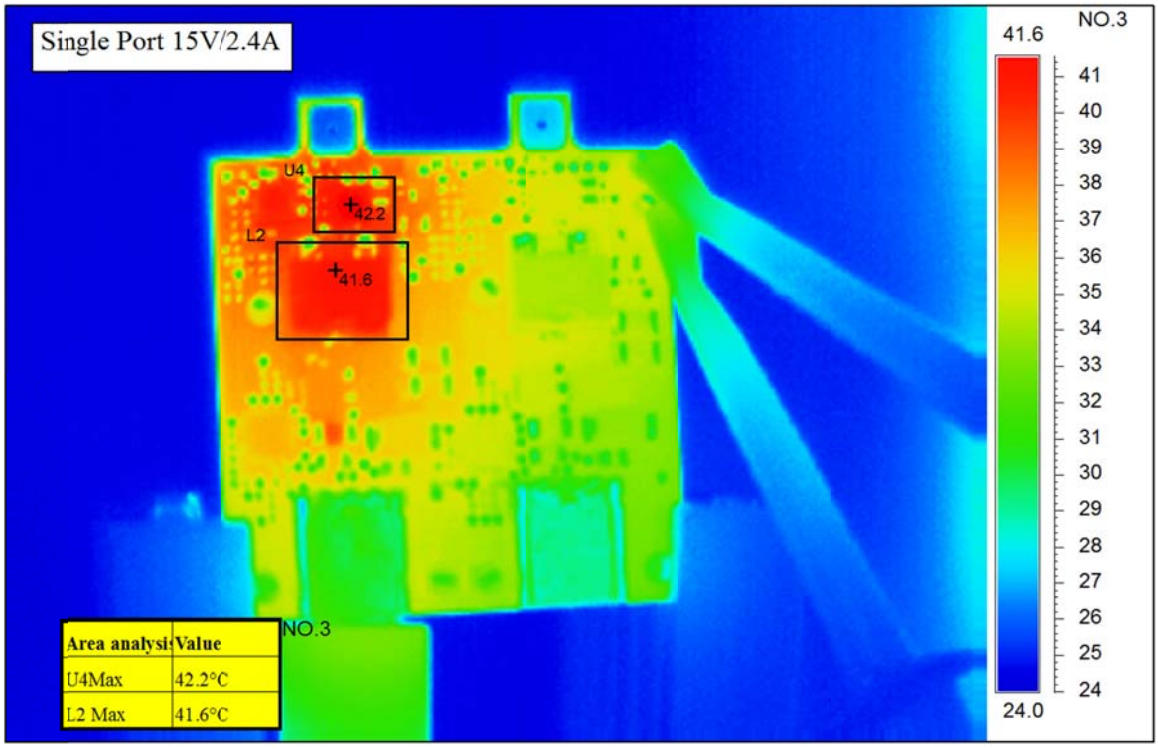
6.1 17V Input, Both Ports 5V Output at 3A



6.2 17V Input, Both Ports 9V Output at 3A

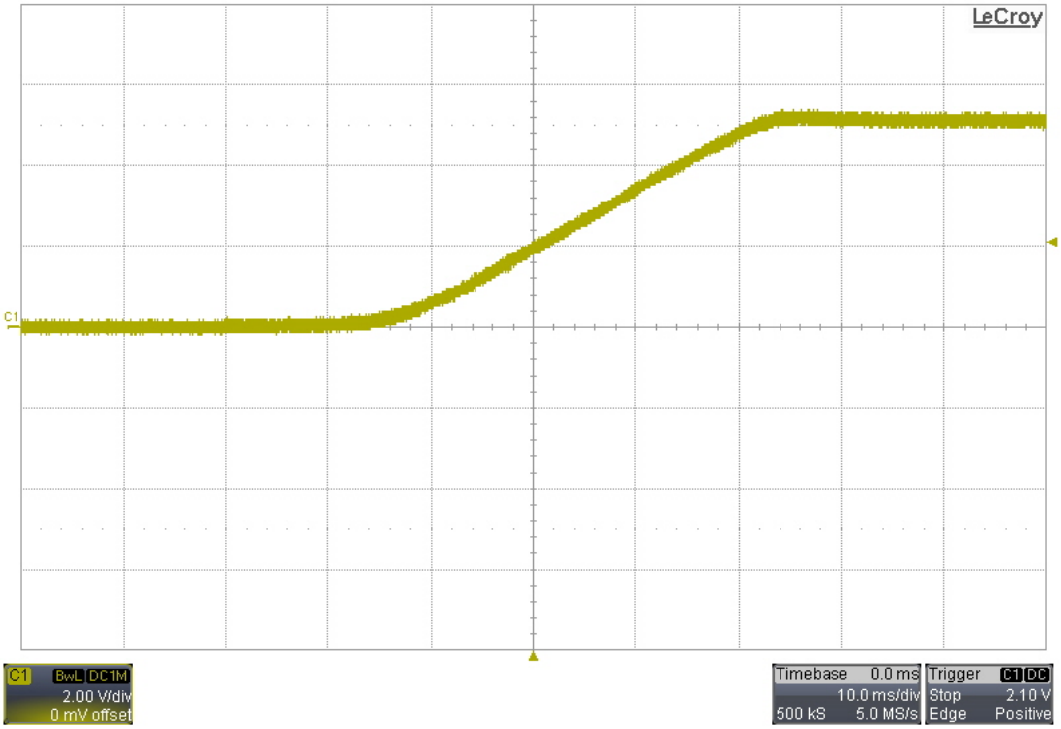


6.3 17V Input, Single Port 15V Output at 2.4A



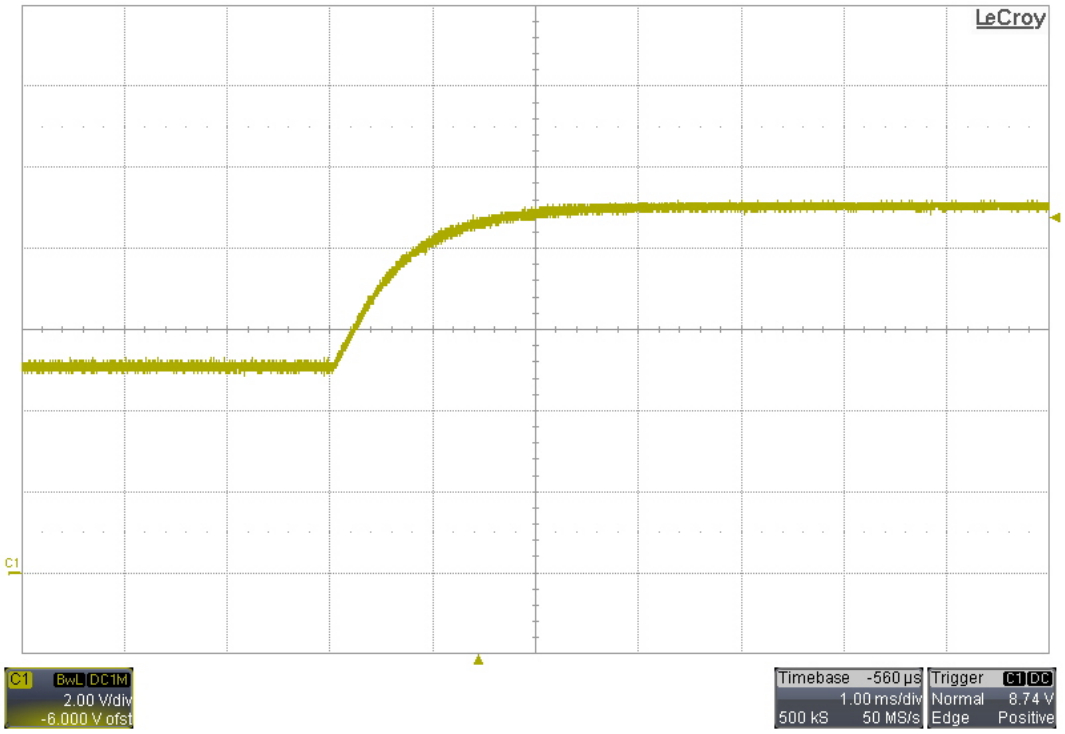
7 Startup

The image below shows the output voltage on TP2/TP8 during a cable plug-in event with no load.

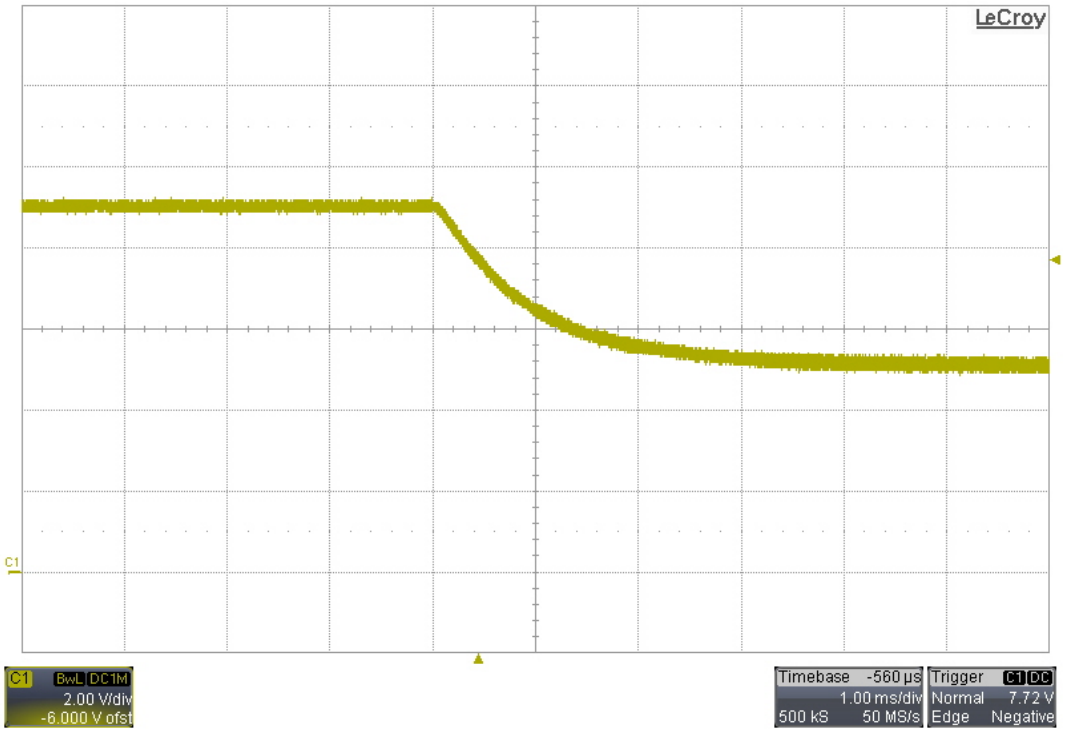


8 Output Voltage Transitions

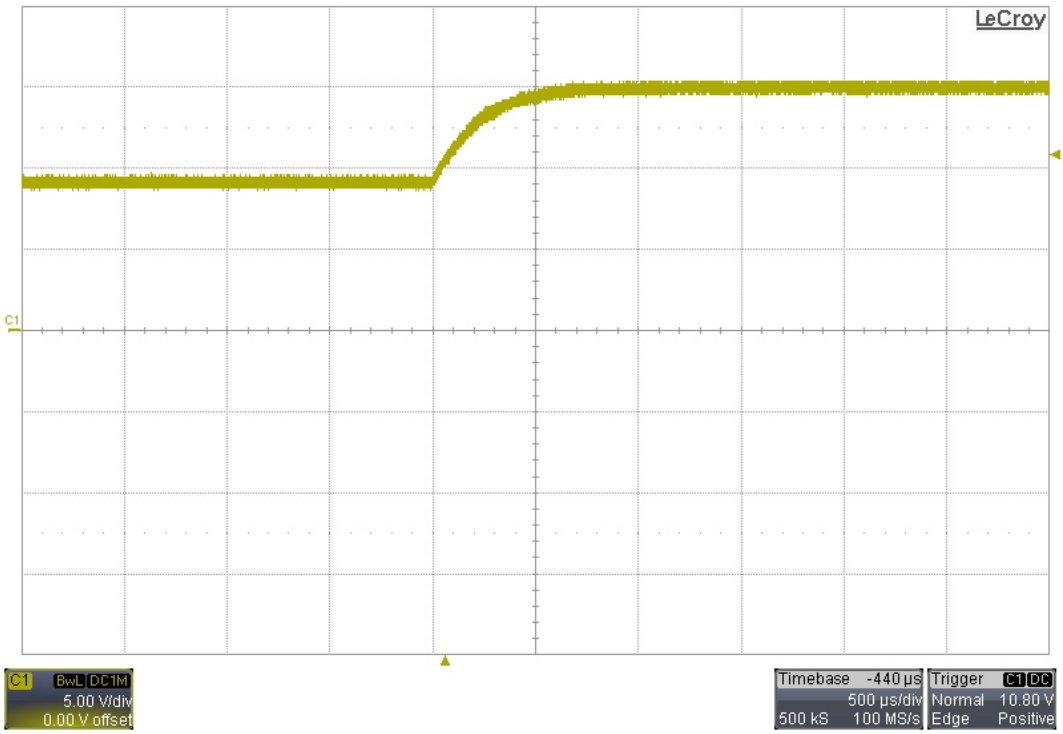
8.1 5V to 9V



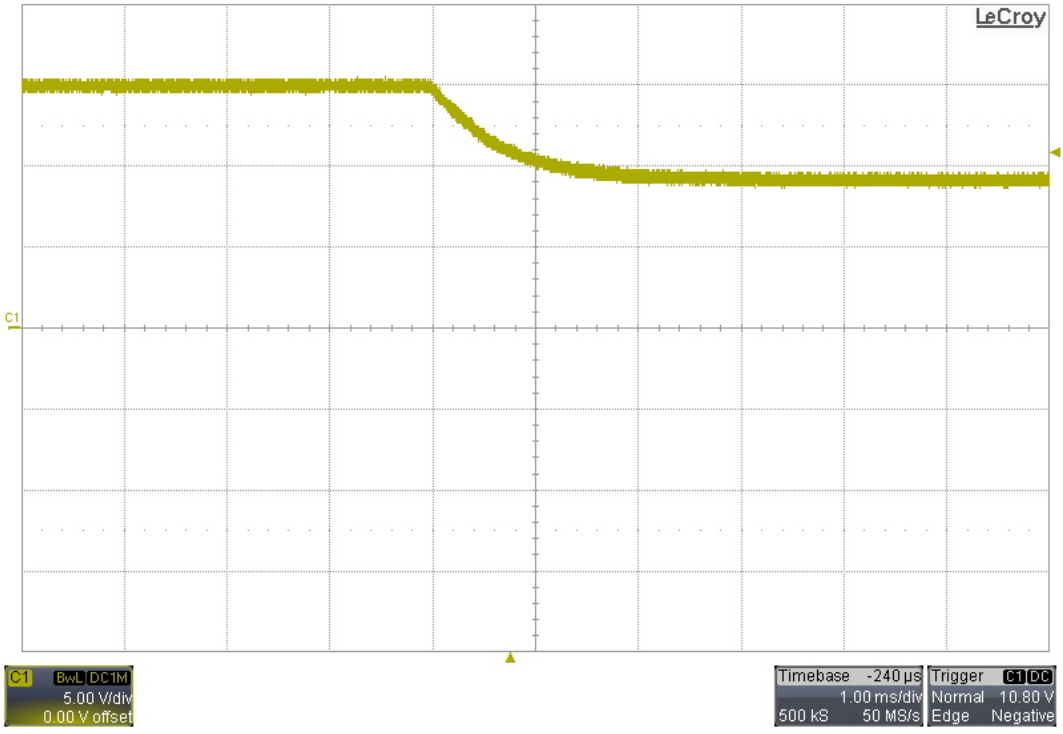
8.2 9V to 5V



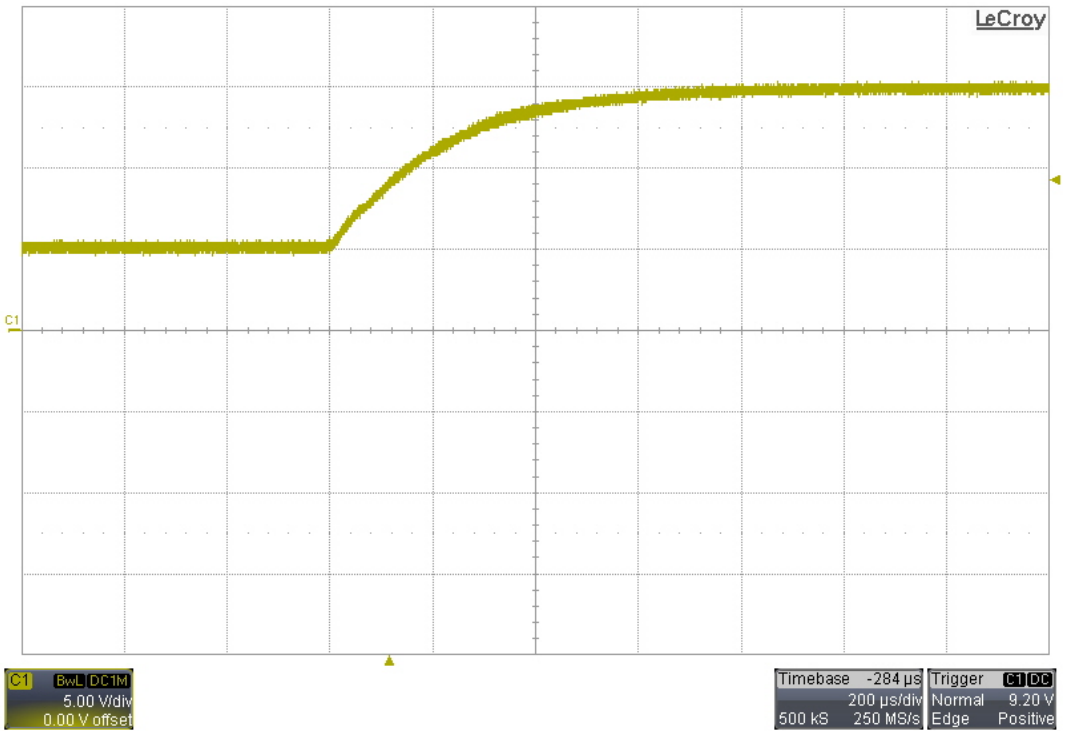
8.3 9V to 15V



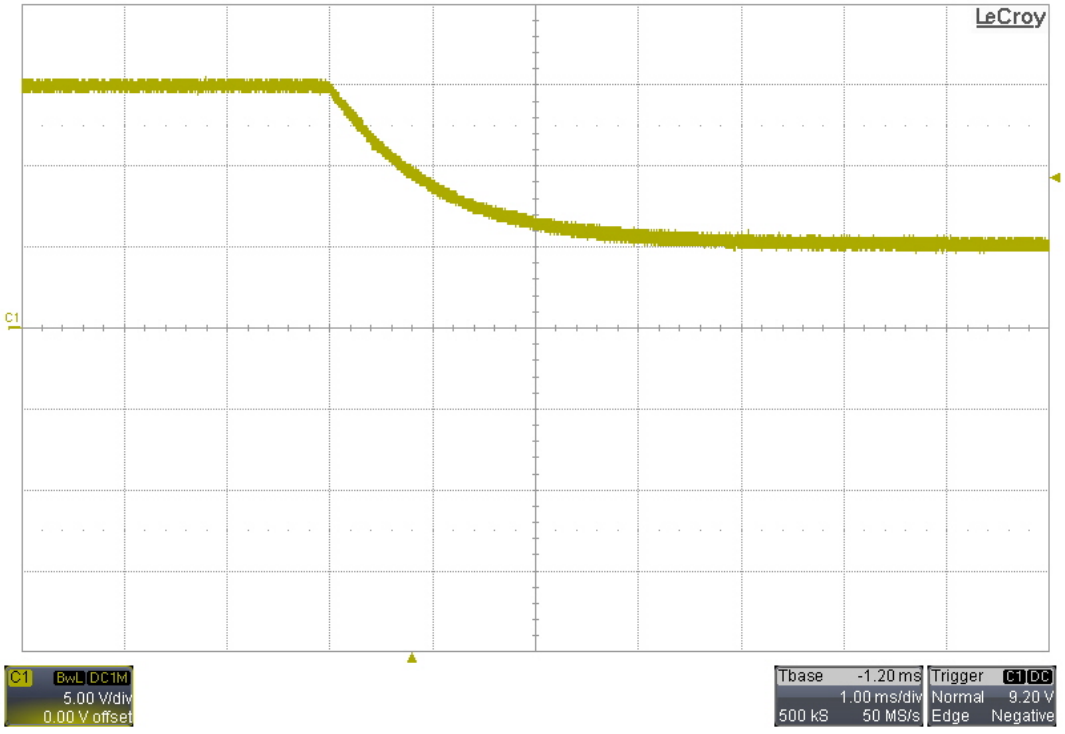
8.4 15V to 9V



8.5 5V to 15V

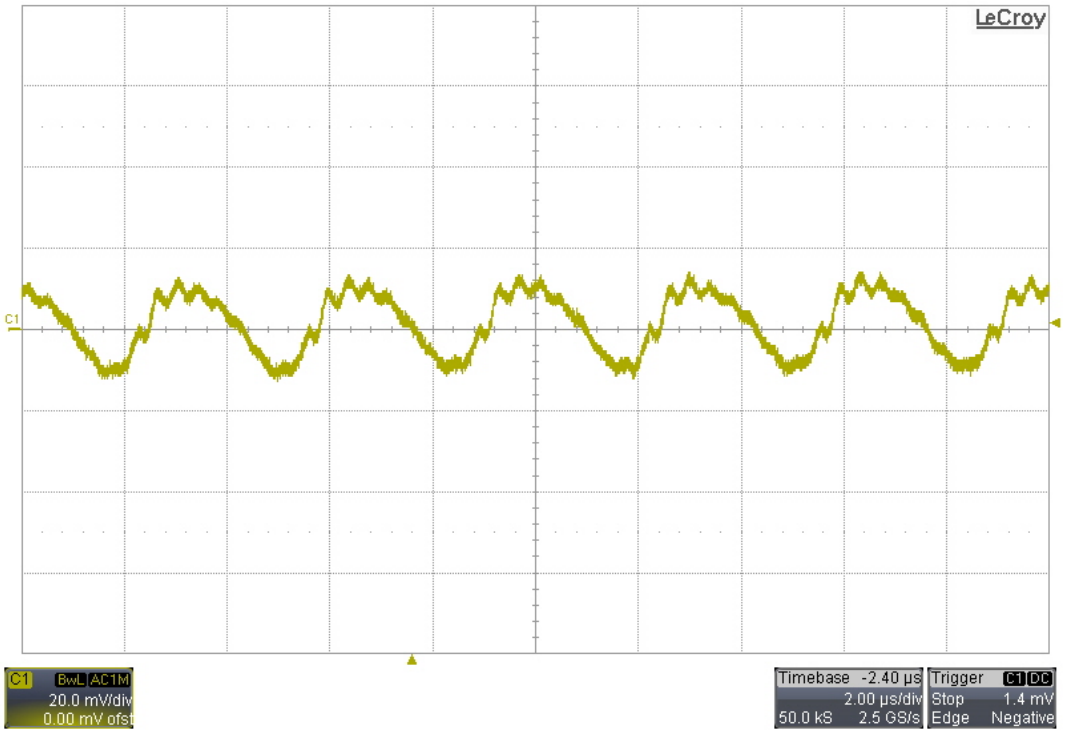


8.6 15V to 5V

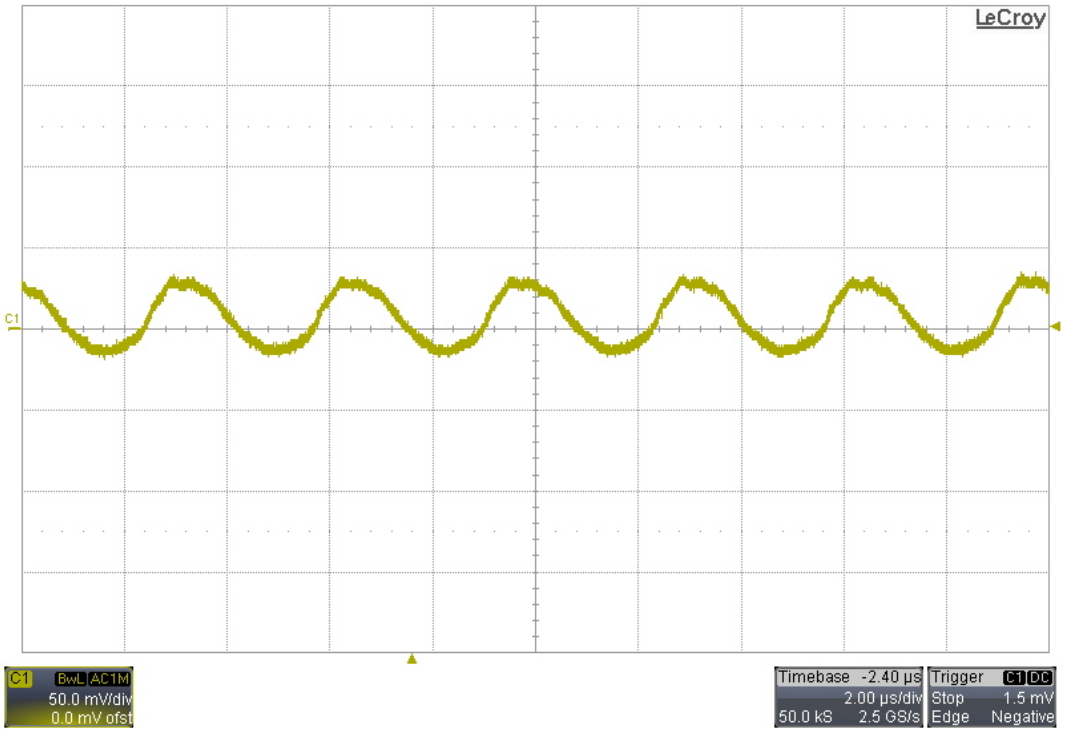


9 Output Ripple Voltage

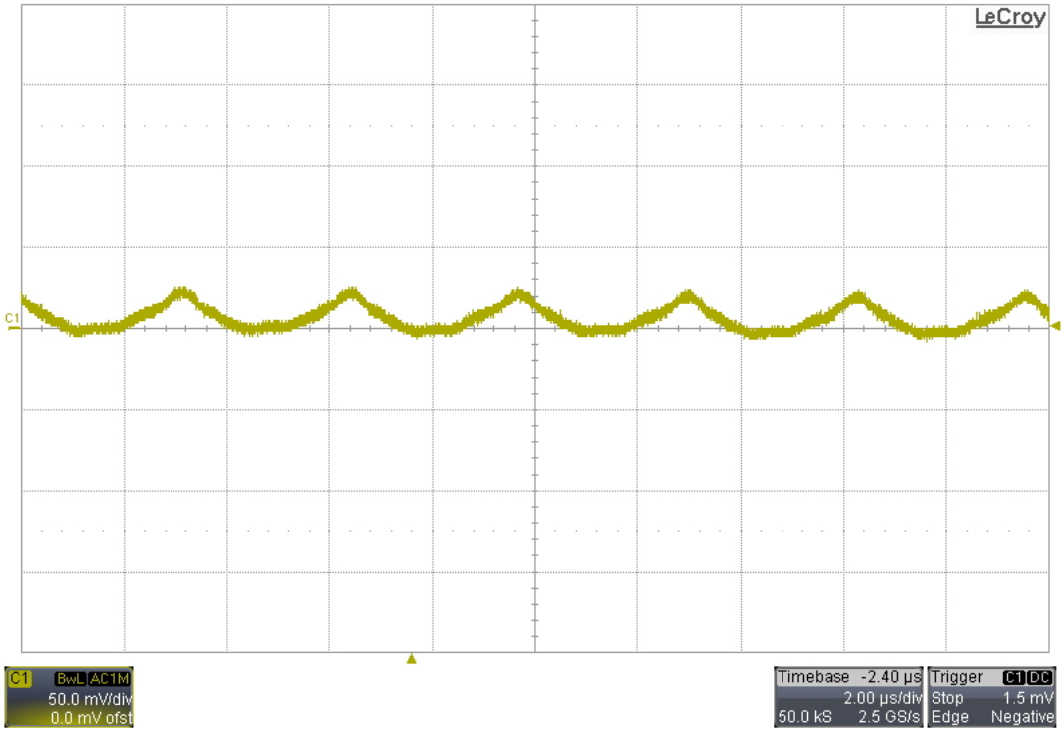
9.1 17V Input, 5V Output at 3A – Measured at TP2/TP8



9.2 17V Input, 9V Output at 3A – Measured at TP2/TP8

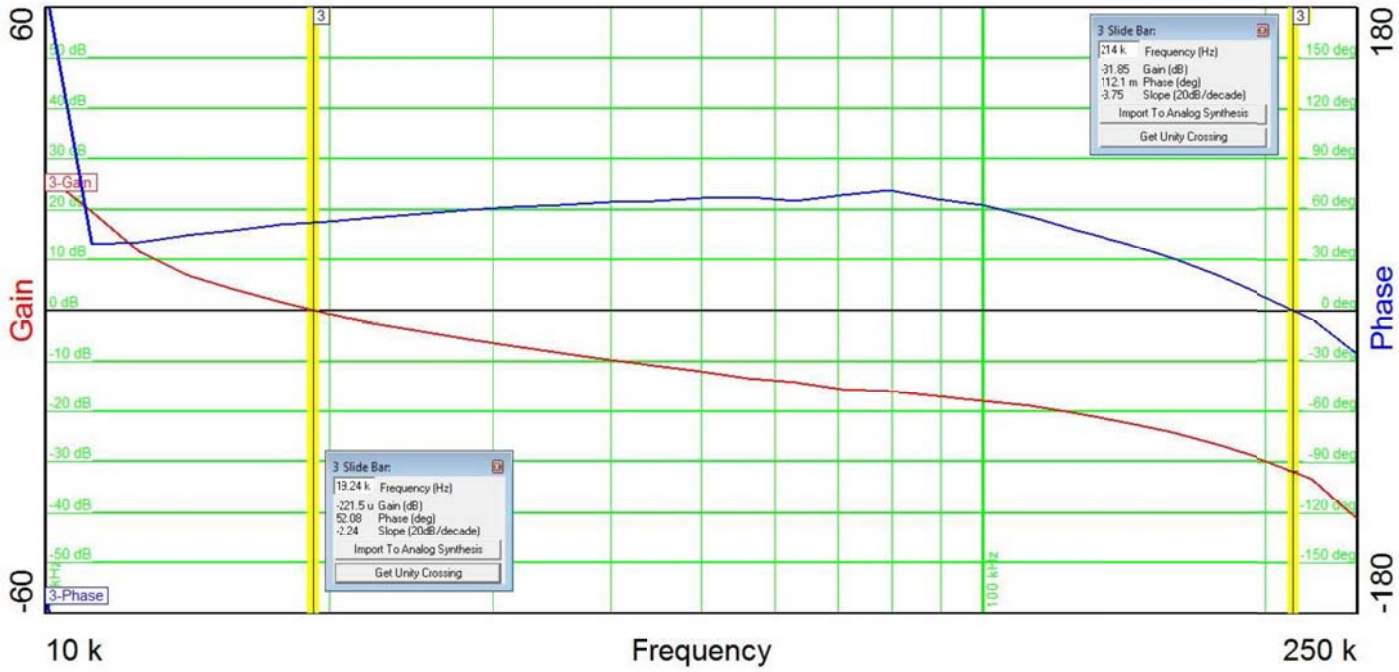


9.3 17V Input, 15V Output at 2.4A – Measured at TP2/TP8

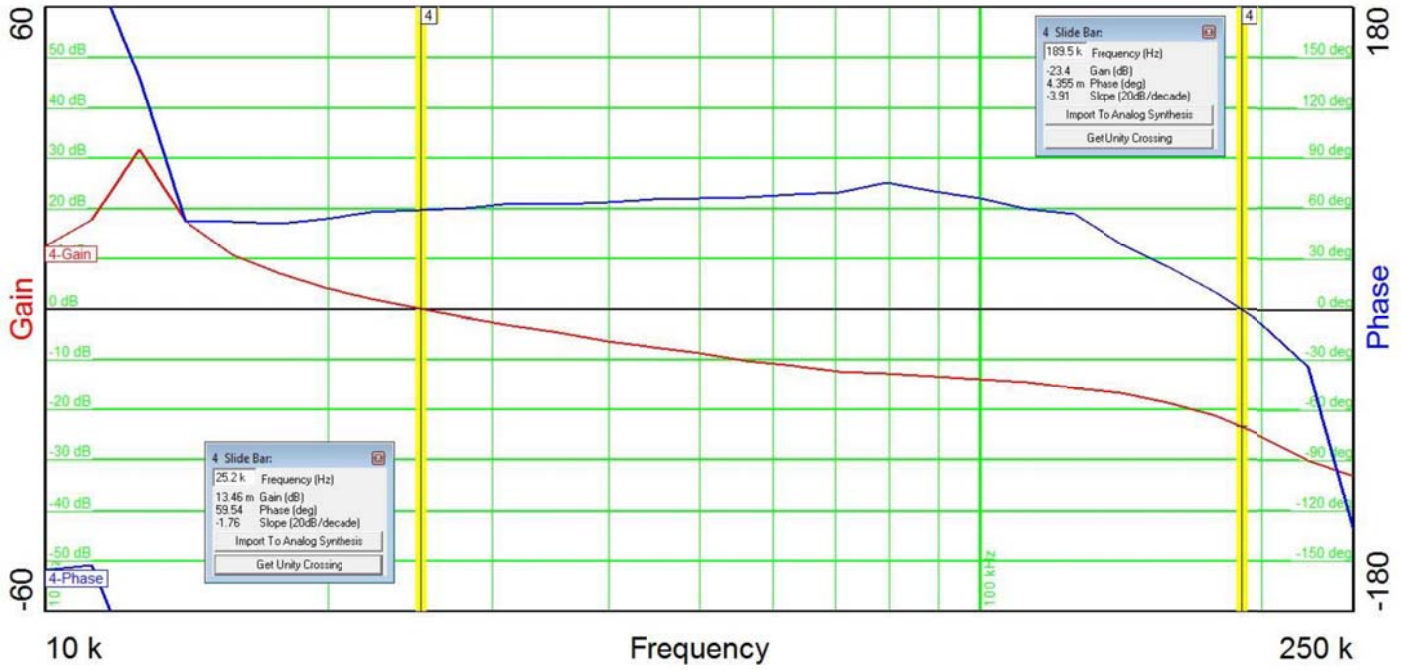


10 Loop Response

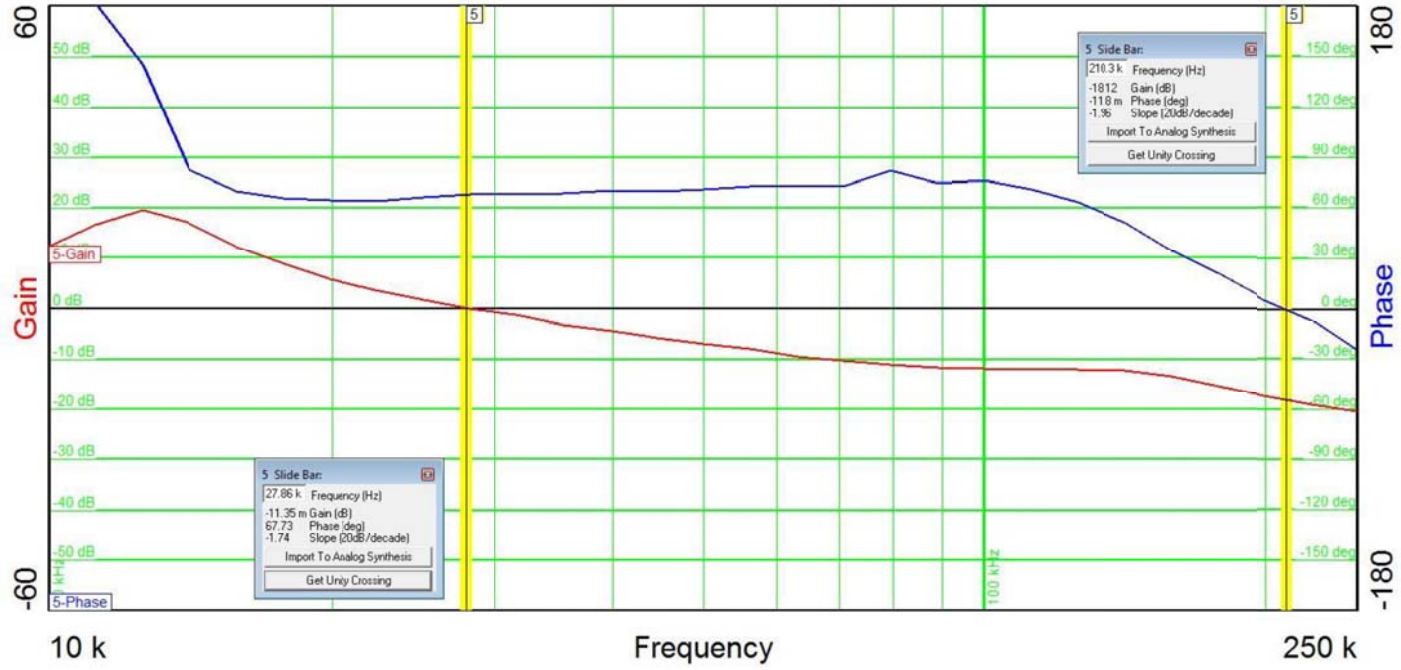
10.1 17V Input, 5V Output at 3A



10.2 17V Input, 9V Output at 3A

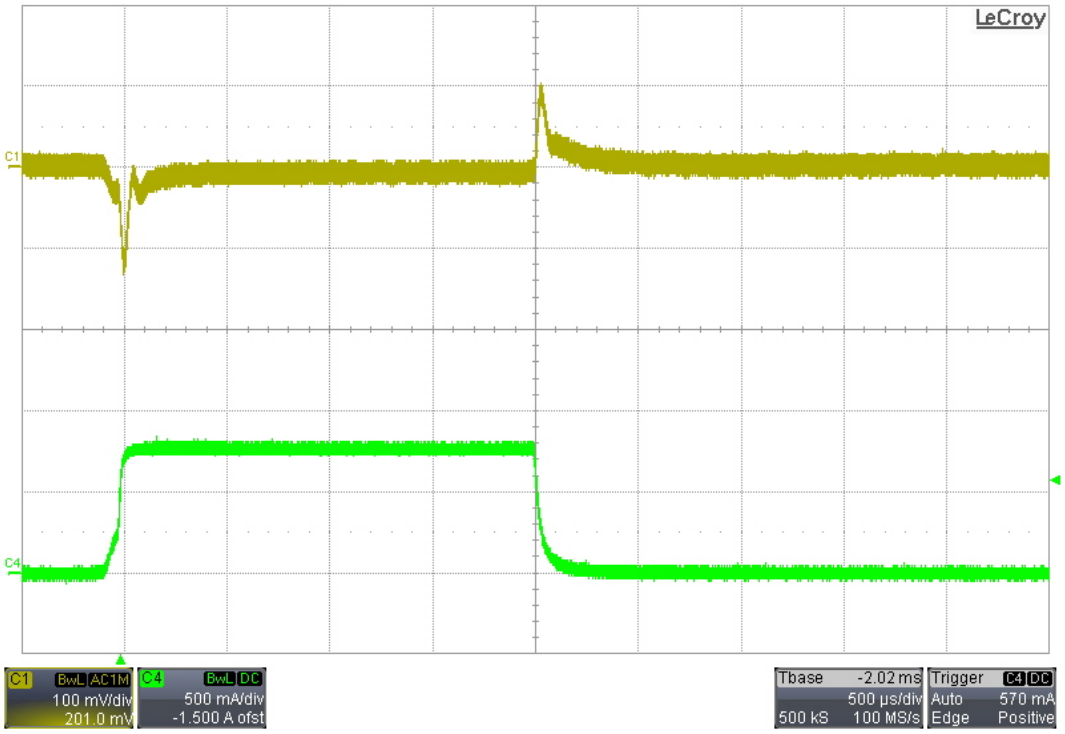


10.3 17V Input, 15V Output at 2.4A

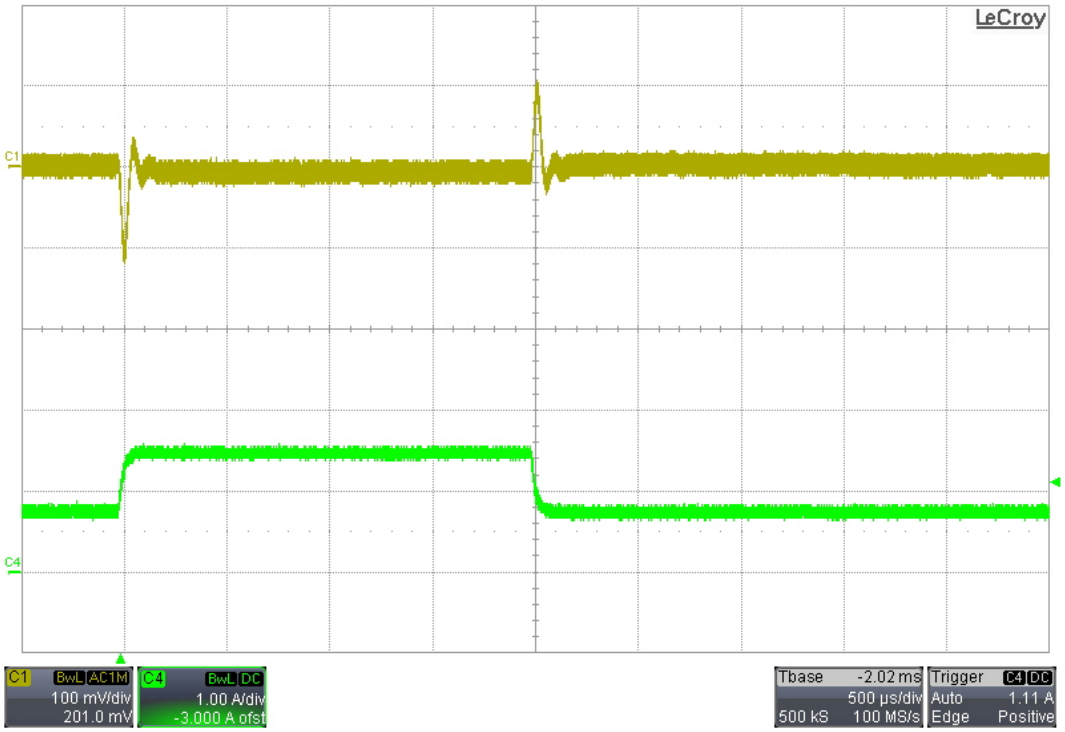


11 Load Transients

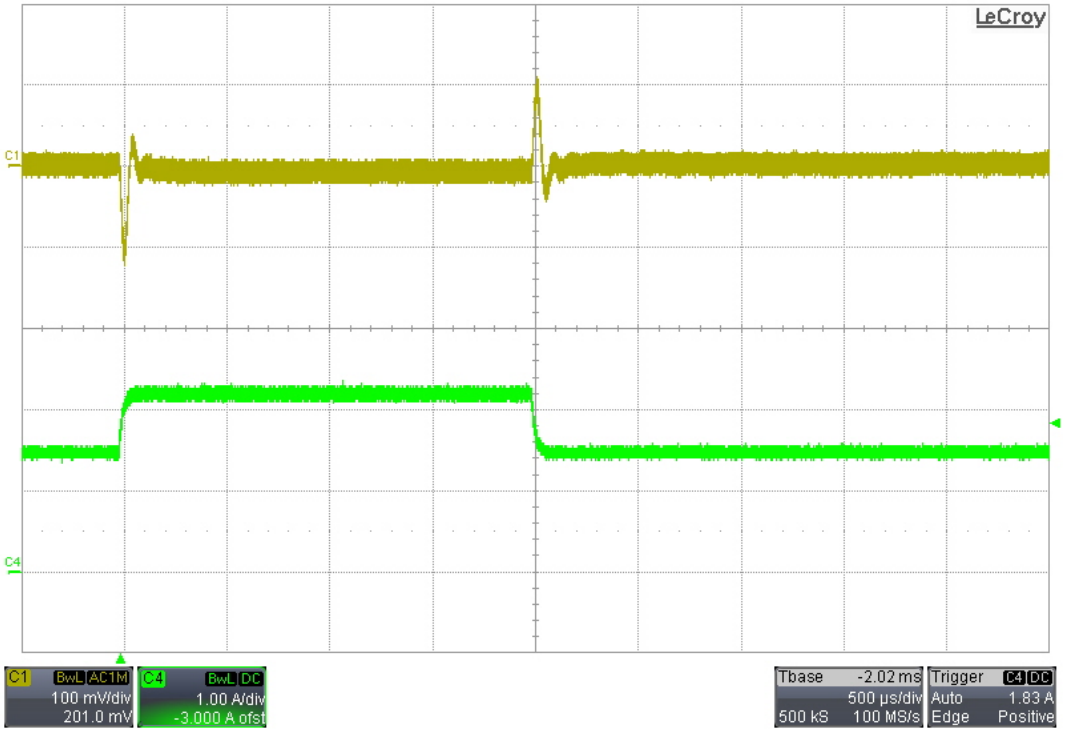
11.1 5Vout, 0A to 750mA (0%-25%), 17Vin



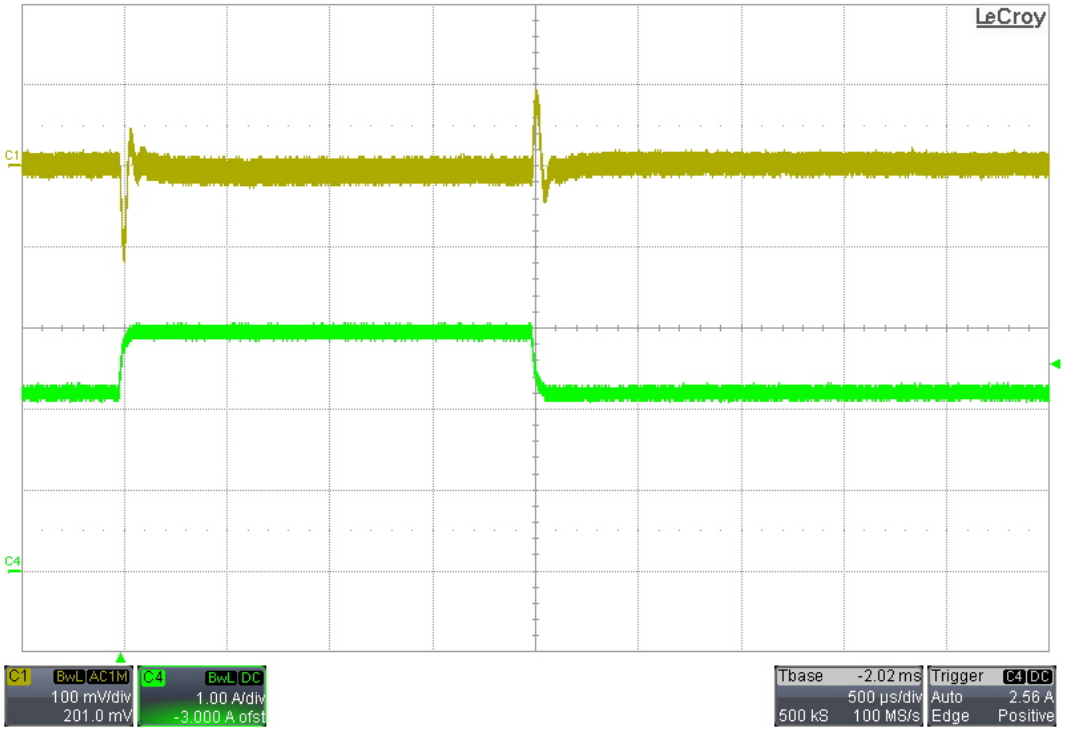
11.2 5Vout, 750mA to 1.5A (25%-50%), 17Vin



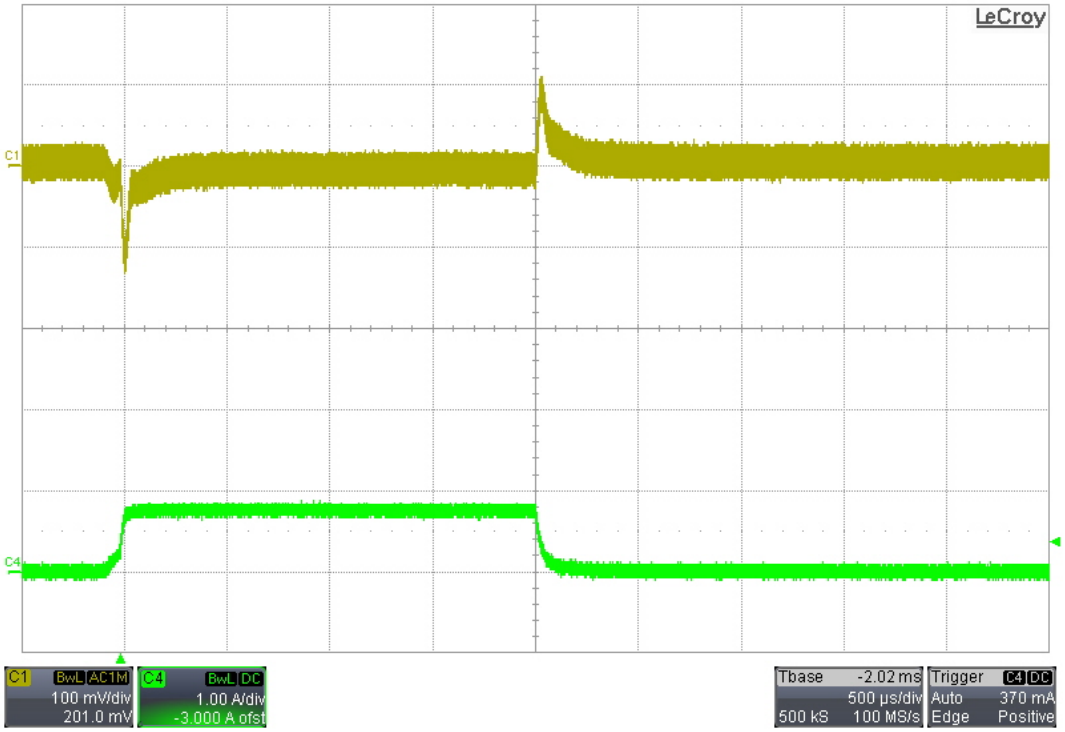
11.3 5Vout, 1.5A to 2.25A (50%-75%), 17Vin



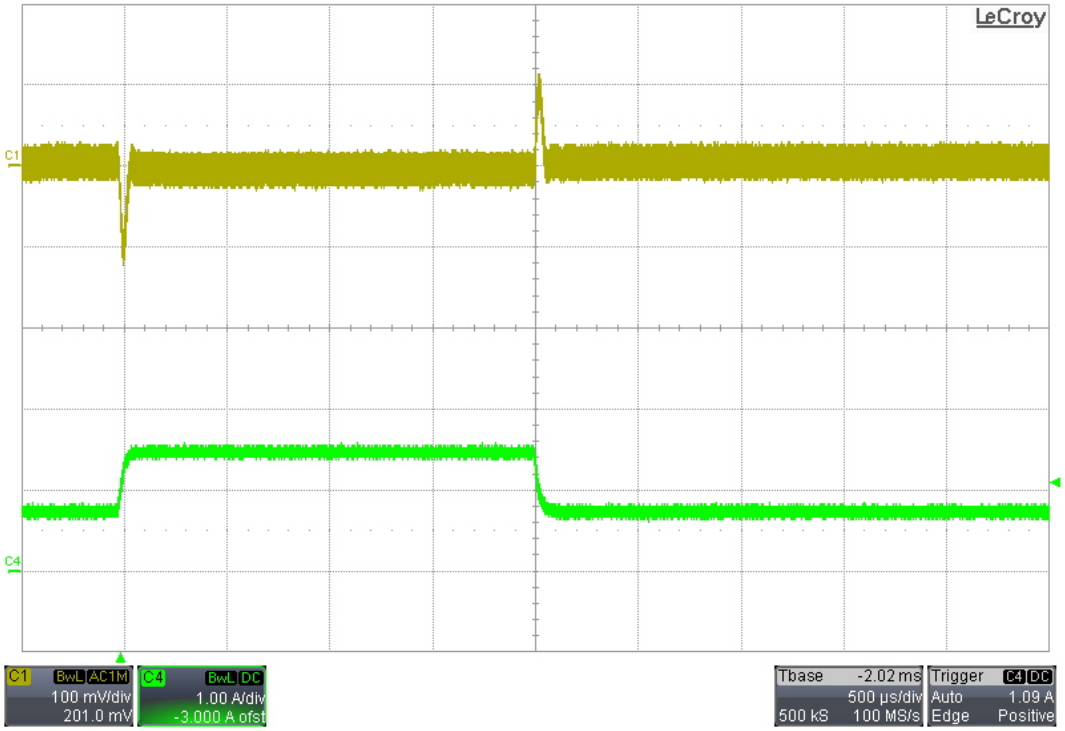
11.4 5Vout, 2.25A to 3.0A (75%-100%), 17Vin



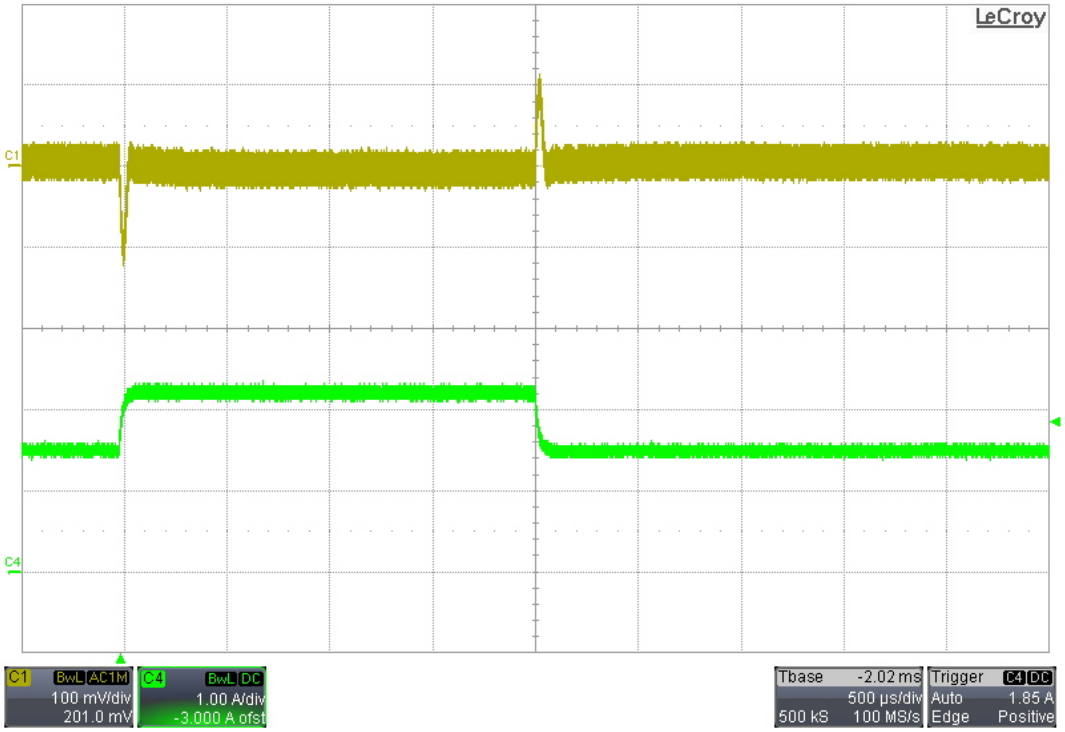
11.5 9Vout, 0A to 750mA (0%-25%), 17Vin



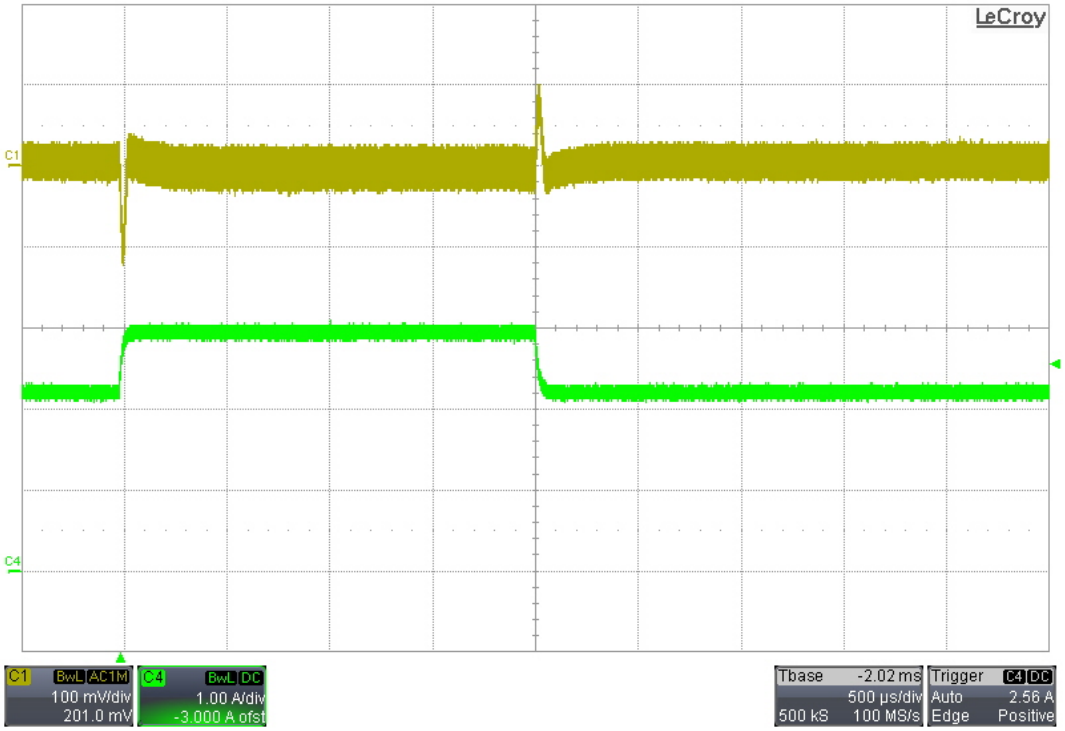
11.6 9Vout, 750mA to 1.5A (25%-50%), 17Vin



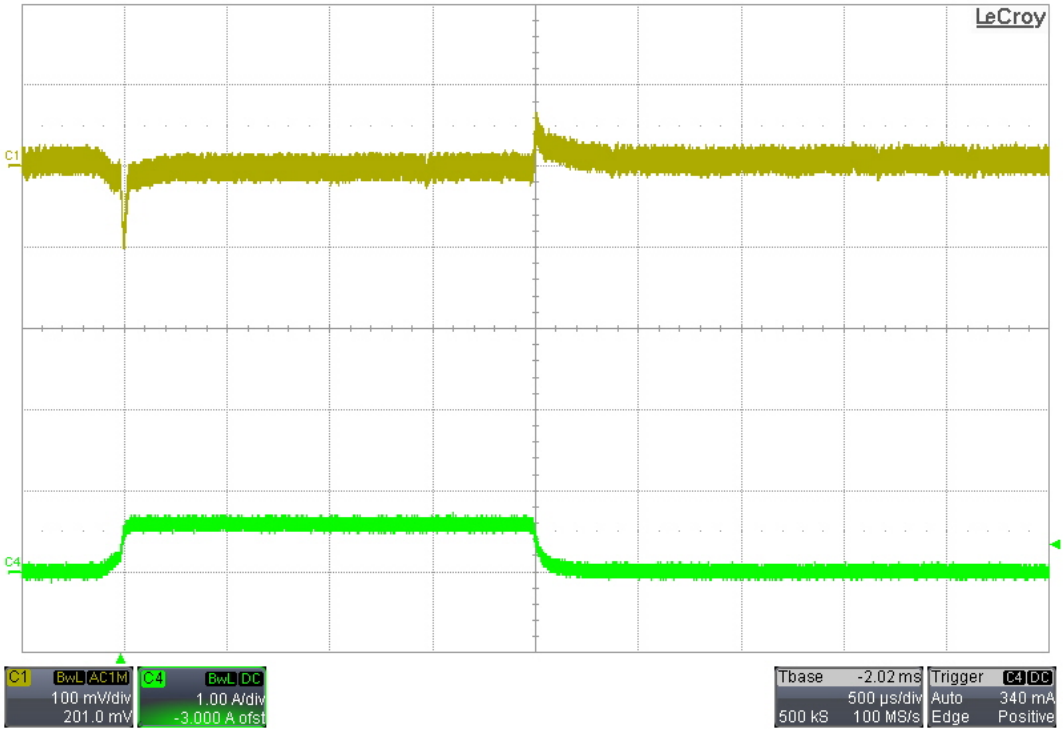
11.7 9Vout, 1.5A to 2.25A (50%-75%), 17Vin



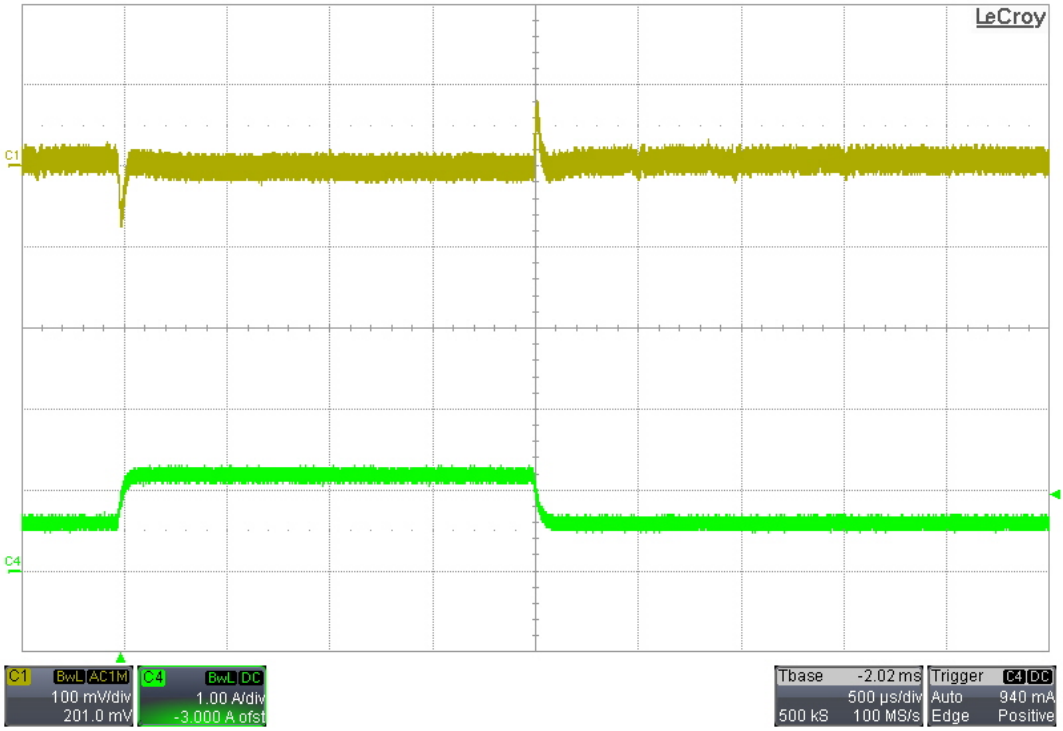
11.8 9Vout, 2.25A to 3.0A (75%-100%), 17Vin



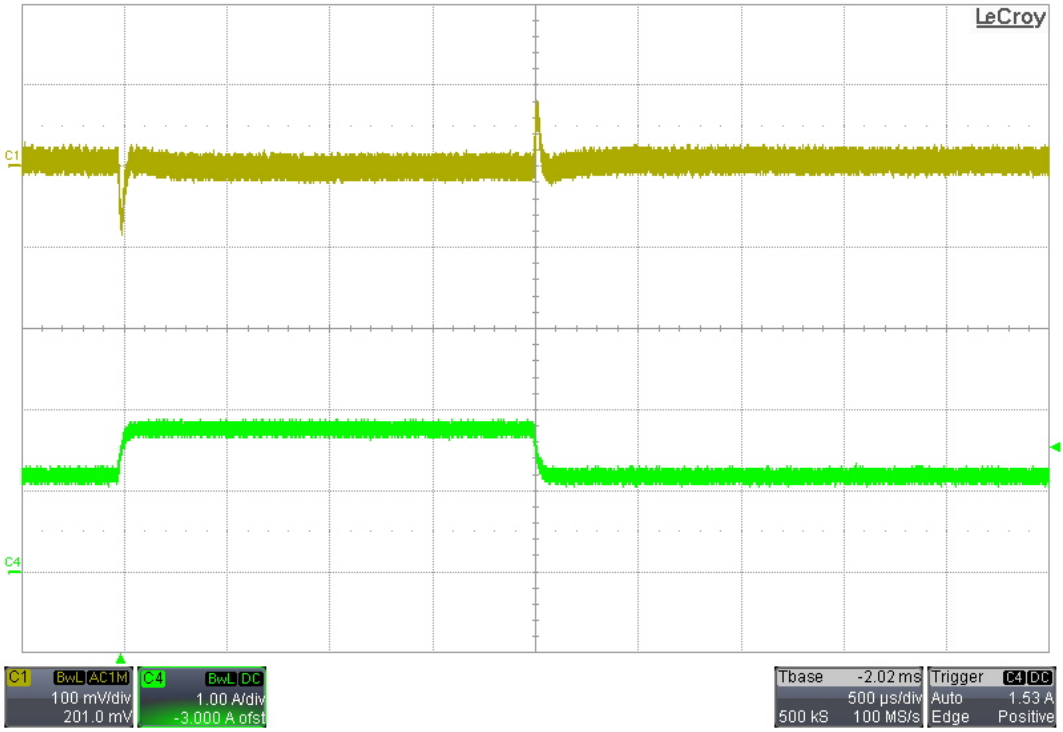
11.9 15Vout, 0A to 600mA (0%-25%), 17Vin



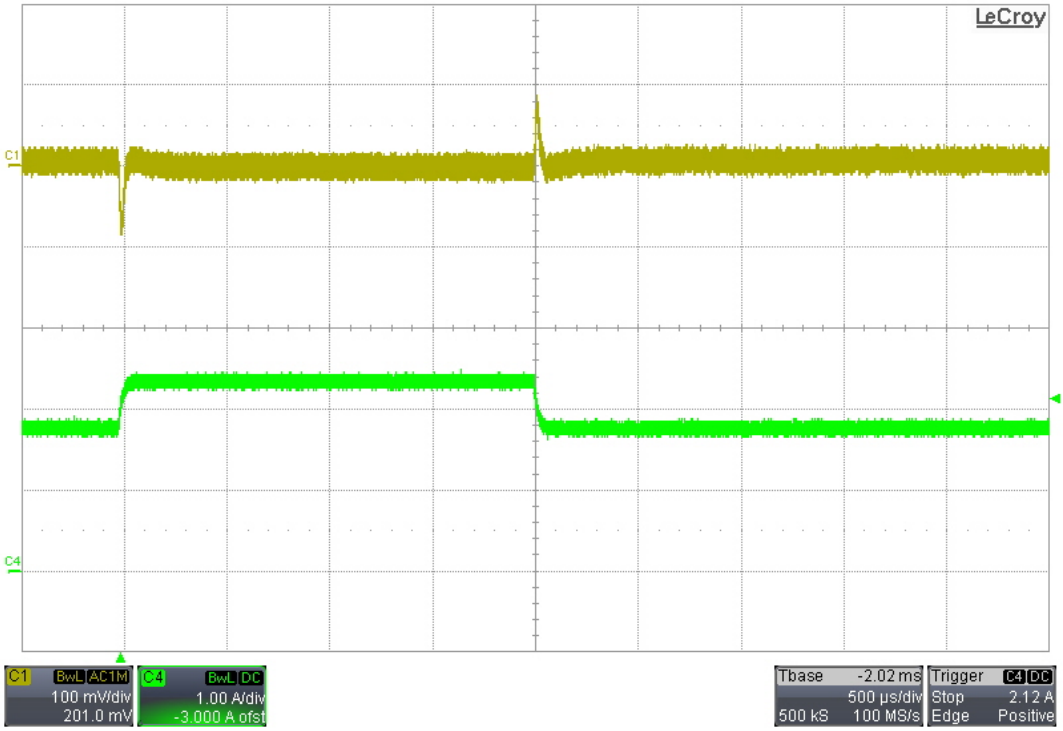
11.10 15Vout, 600mA to 1.2A (25%-50%), 17Vin



11.11 15Vout, 1.2A to 1.8A (50%-75%), 17Vin

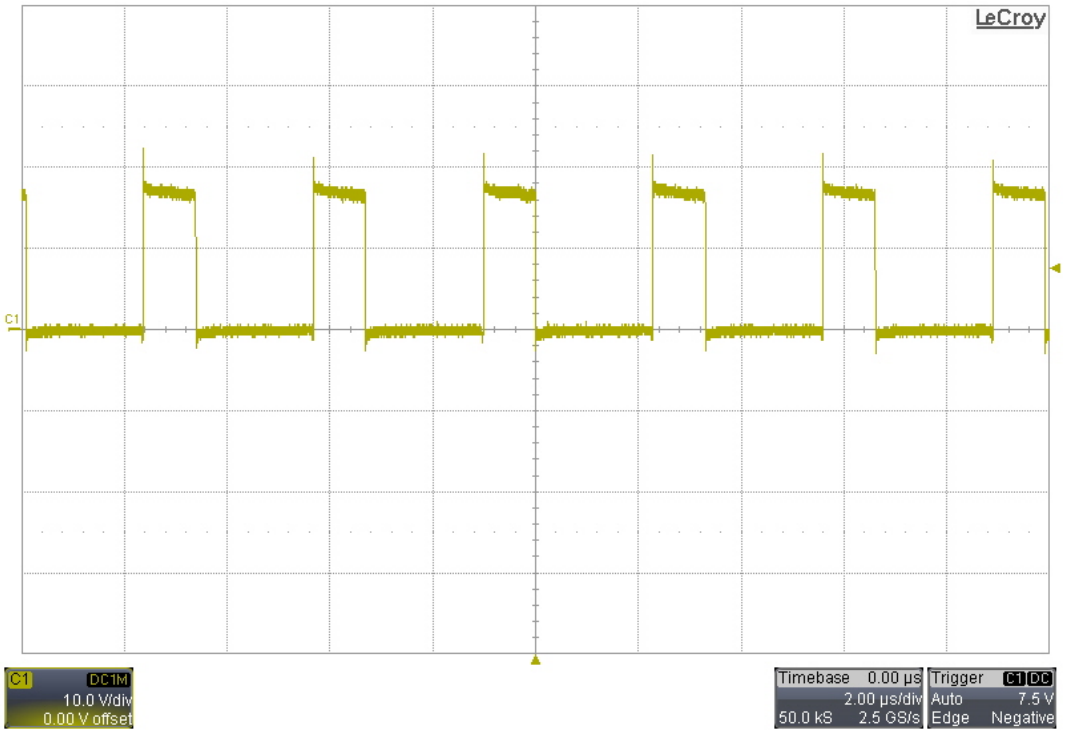


11.12 15Vout, 1.8A to 2.4A (75%-100%), 17Vin

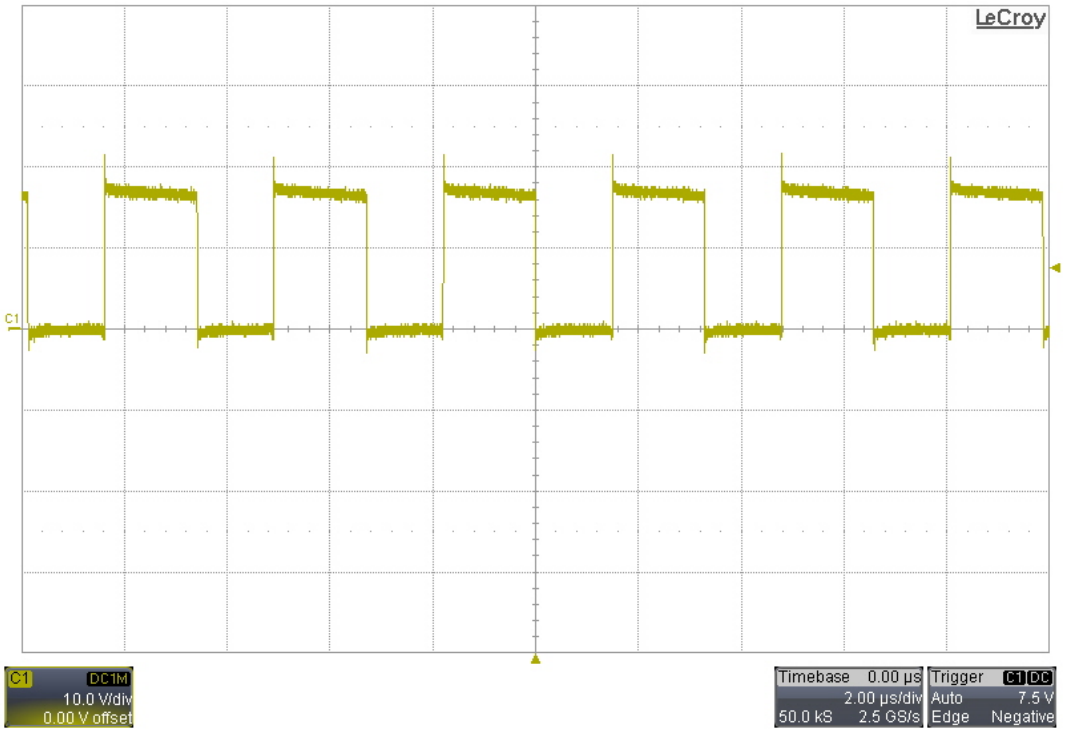


12 Switching Waveforms

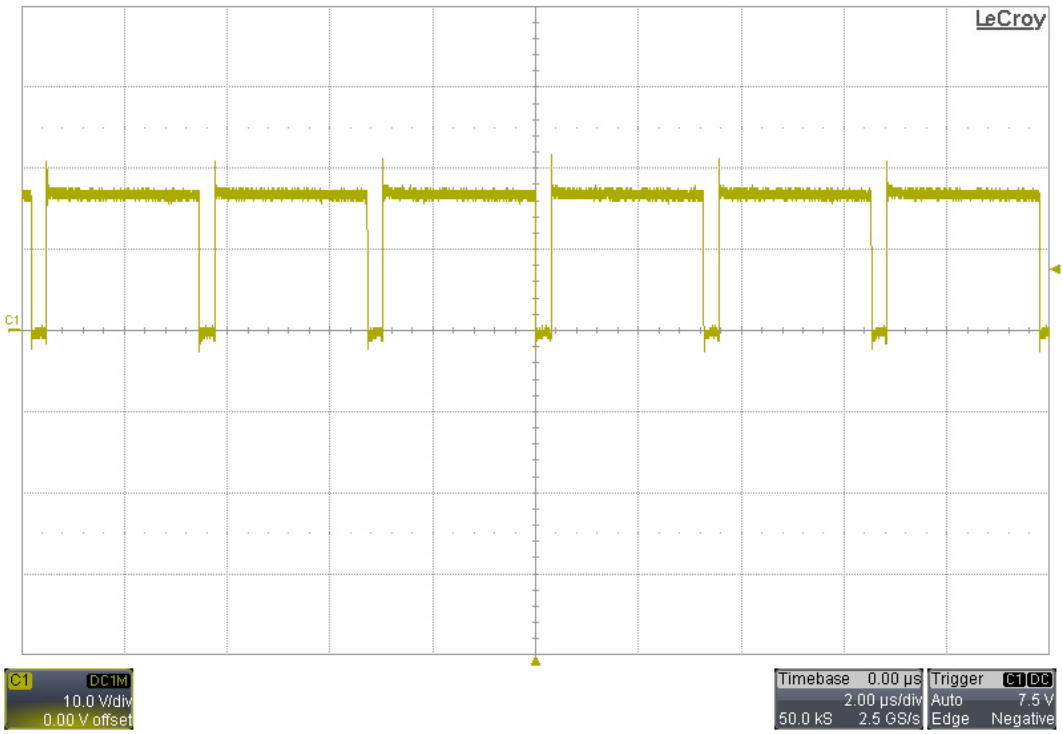
12.1 Switch Node – 17V Input, 5V Output at 3A



12.2 Switch Node – 17V Input, 9V Output at 3A



12.3 Switch Node – 17V Input, 15V Output at 2.4A



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