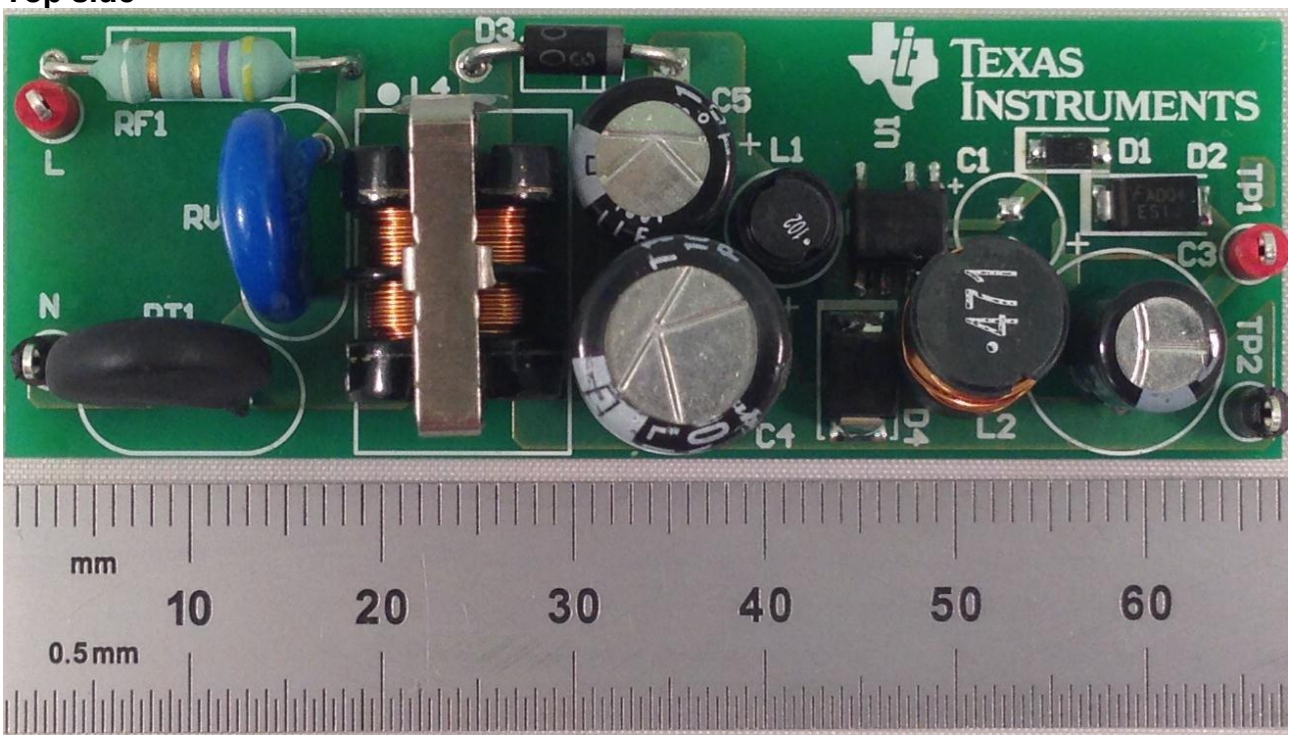
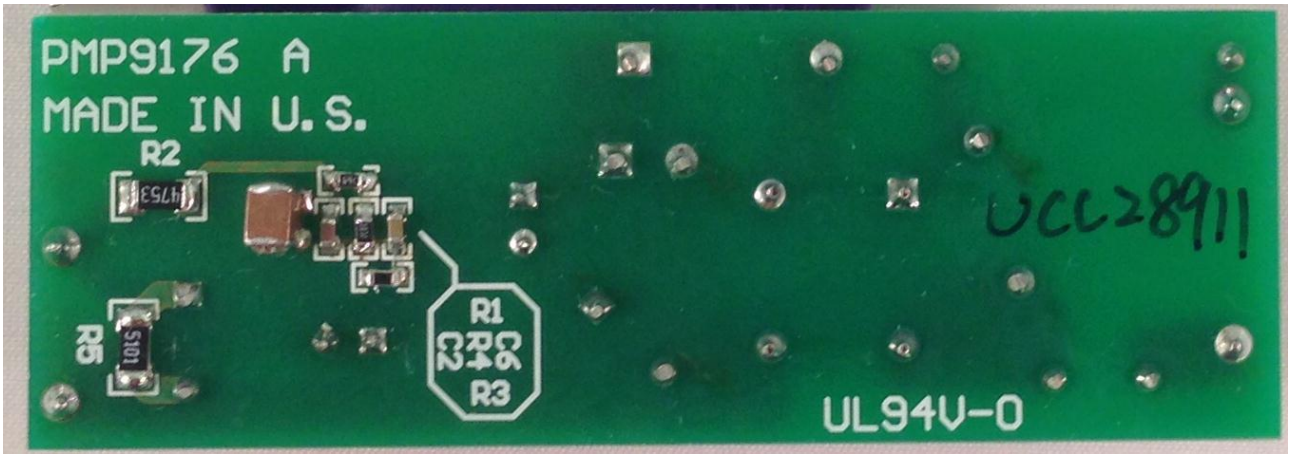
1 Photo

The photographs below show the PMP10767 Rev A assembly. This circuit was built on a PMP9176 Rev A PCB.

Top side

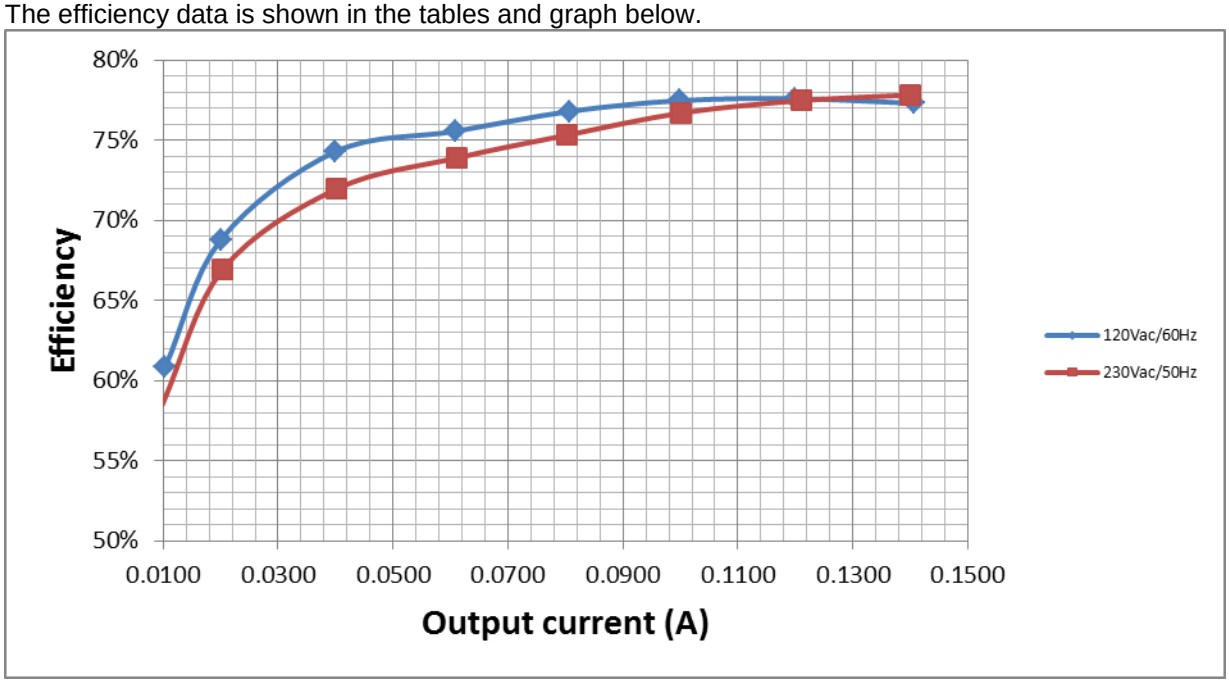


Bottom side



2 Converter Efficiency

The efficiency data is shown in the tables and graph below.



V_{in}=120V_{AC}/60Hz

Vin(V)	Iin(mA)	Pin(W)	Vout(V)	Iout(A)	Pout(W)	Losses(W)	Efficiency (%)
120.02	57.22	2.721	14.96	0.1406	2.103	0.618	77.30%
120.03	49.87	2.310	14.95	0.1199	1.793	0.517	77.60%
120.04	42.82	1.926	14.95	0.0998	1.492	0.434	77.47%
120.04	36.11	1.571	14.95	0.0807	1.206	0.365	76.80%
120.05	28.94	1.203	14.95	0.0608	0.909	0.294	75.56%
120.05	20.62	0.802	14.94	0.0399	0.596	0.206	74.27%
120.07	12.35	0.436	14.97	0.0200	0.300	0.136	68.78%
120.07	7.82	0.255	14.99	0.0104	0.155	0.100	60.85%
120.08	2.28	0.059	15.4	0.0000	0.000	0.059	0.00%

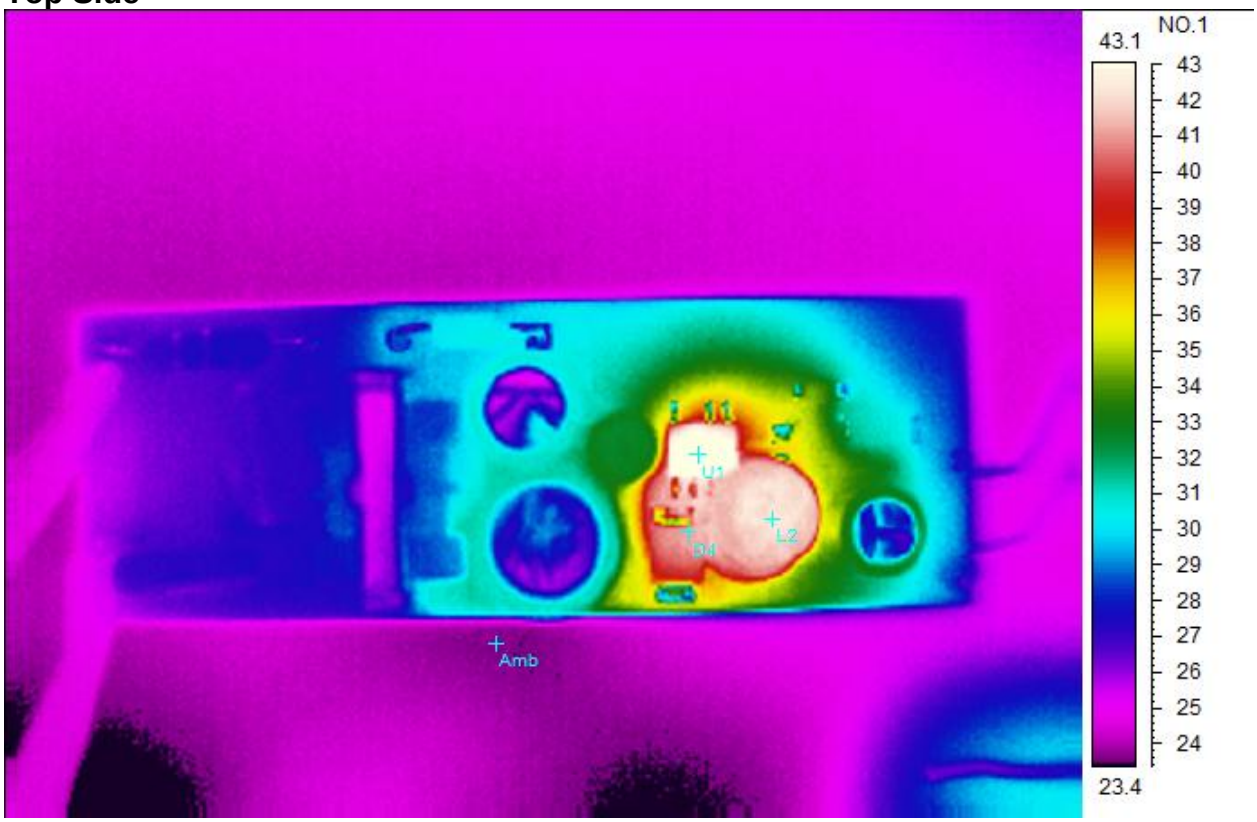
V_{in}=230V_{AC}/50Hz

Vin(V)	Iin(mA)	Pin(W)	Vout(V)	Iout(A)	Pout(W)	Losses(W)	Efficiency (%)
230	36.39	2.691	14.96	0.1400	2.094	0.597	77.83%
230	32.36	2.335	14.95	0.1210	1.809	0.526	77.47%
230	27.88	1.953	14.95	0.1002	1.498	0.455	76.70%
230	23.52	1.592	14.95	0.0802	1.199	0.393	75.31%
230	19.11	1.238	14.95	0.0612	0.915	0.323	73.90%
230	13.77	0.837	14.97	0.0402	0.602	0.235	71.97%
230	8.24	0.457	14.99	0.0204	0.306	0.151	66.95%
230	4.96	0.251	14.96	0.0098	0.147	0.104	58.48%
230	1.50	0.063	15.04	0.0000	0.000	0.063	0.00%

3 Thermal Images

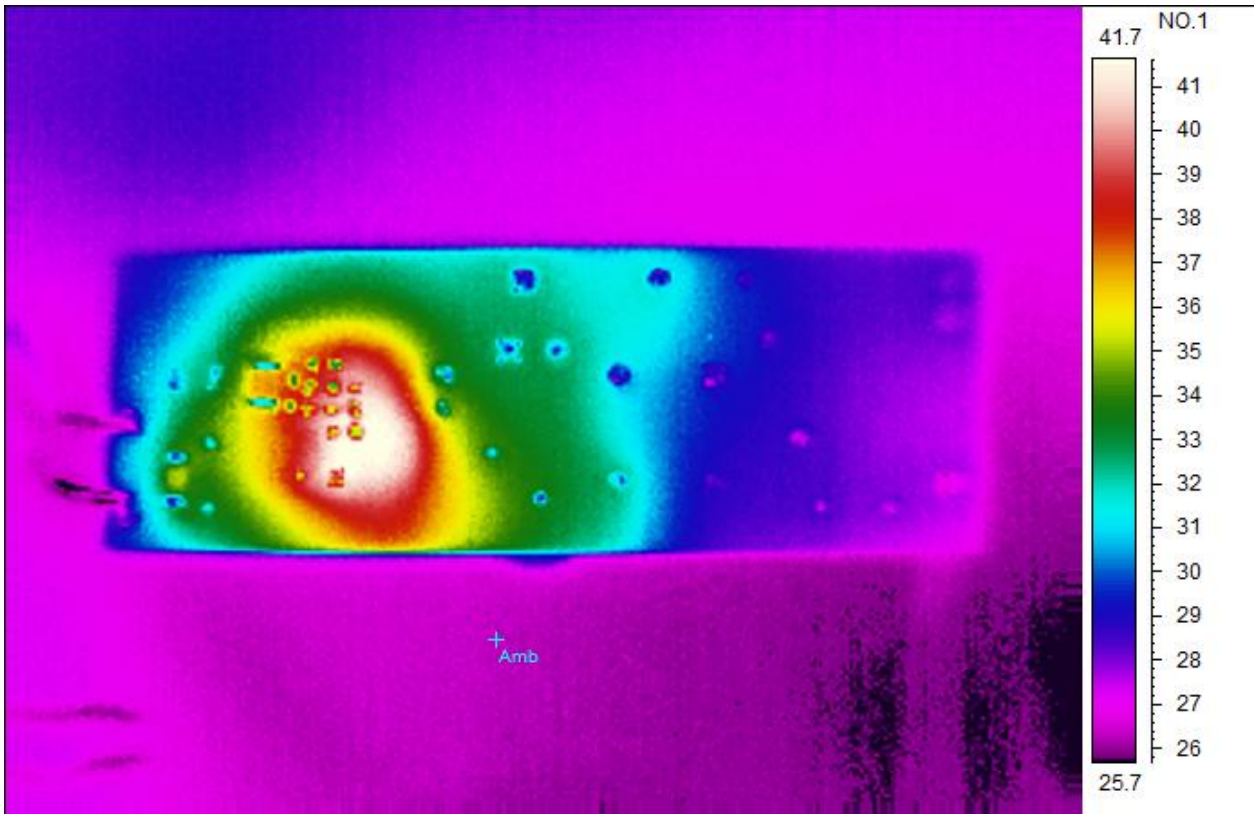
The thermal images below show a top view and bottom view of the board under 120V_{AC}/60Hz and 230V_{AC}/50Hz input conditions. The ambient temperature was 20ºC with no forced air flow. The output was at full load: 15V/0.14A.

V_{in}=120V_{AC}/60Hz
Top Side



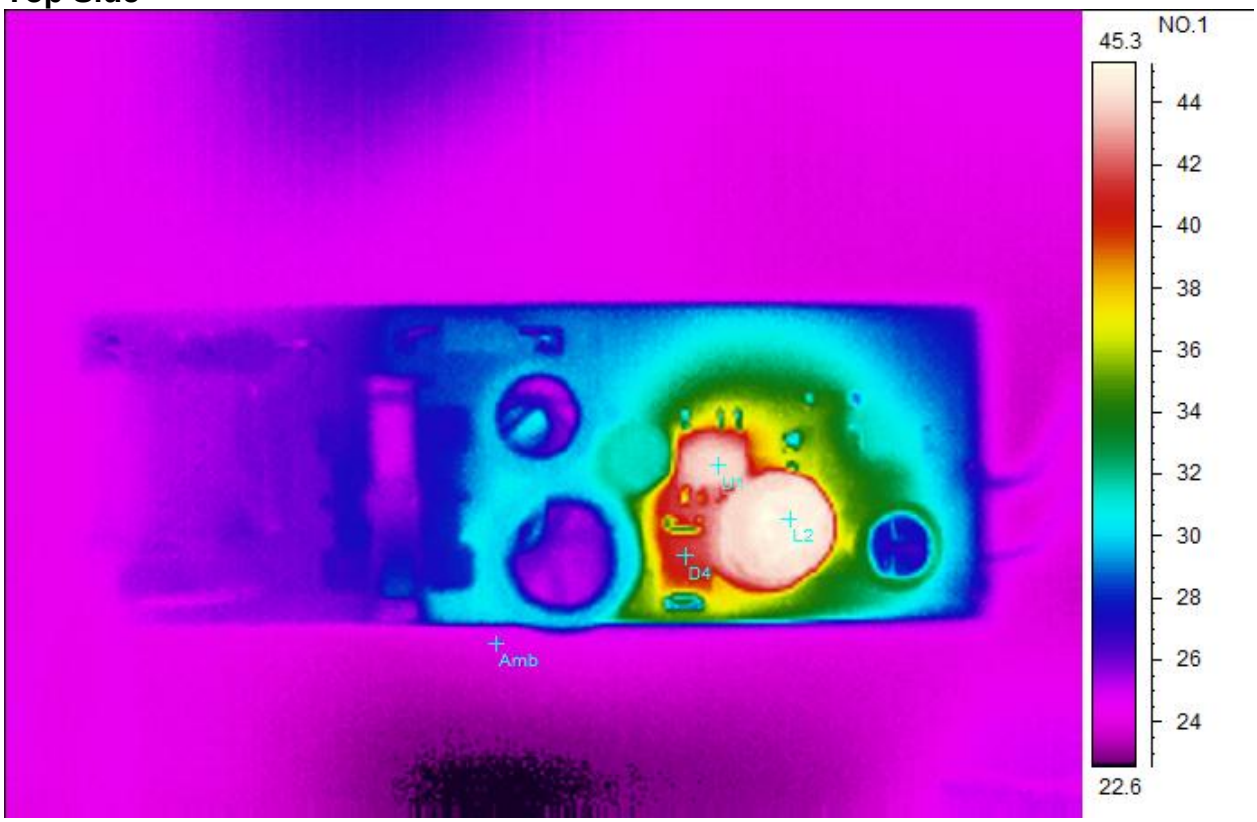
Spot analysis	Value
Amb Temperature	23.7°C
U1Temperature	44.4°C
D4Temperature	41.4°C
L2 Temperature	42.6°C

V_{in}=120V_{AC}/60Hz
Bottom Side



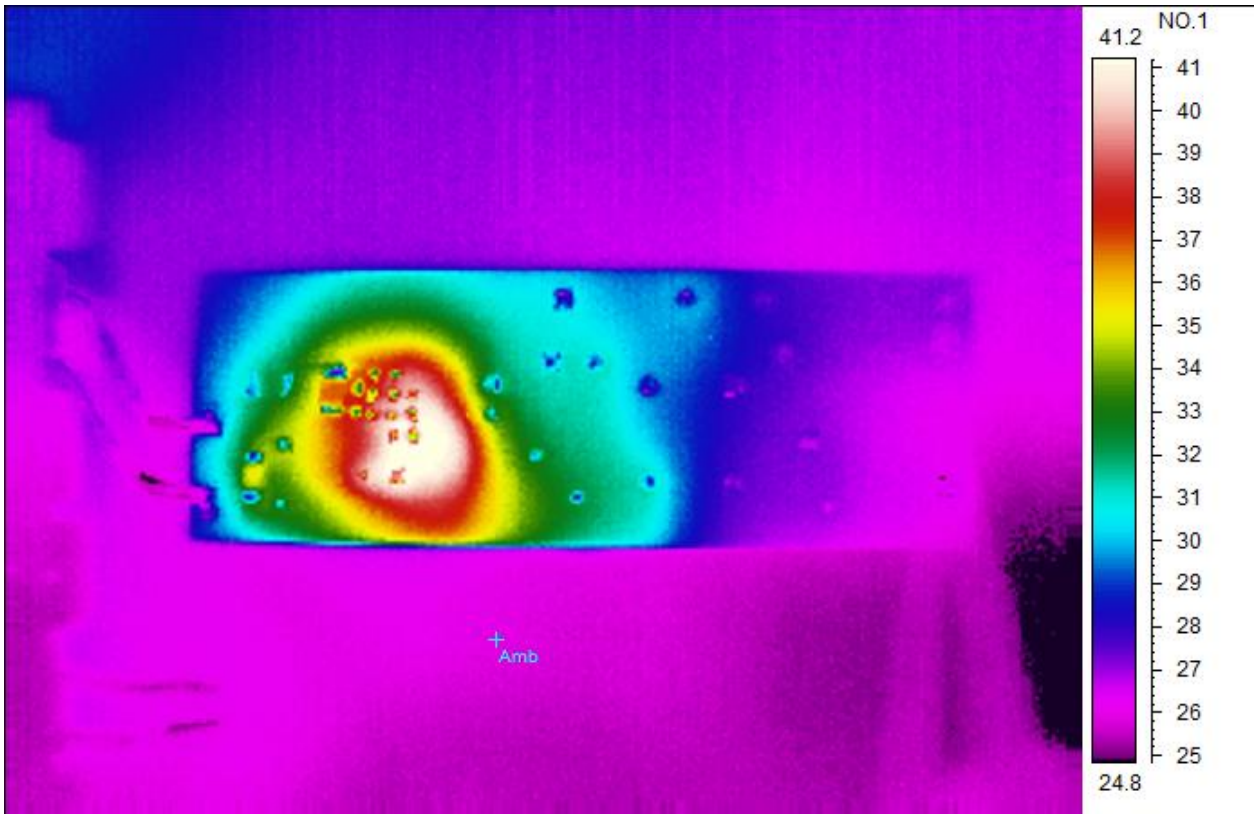
Spot analysis	Value
Amb Temperature	26.3°C

V_{in}=230V_{AC}/50Hz
Top Side



Spot analysis	Value
Amb Temperature	24.2°C
U1Temperature	44.2°C
D4Temperature	41.4°C
L2 Temperature	45.3°C

V_{in}=230V_{AC}/50Hz
Bottom Side

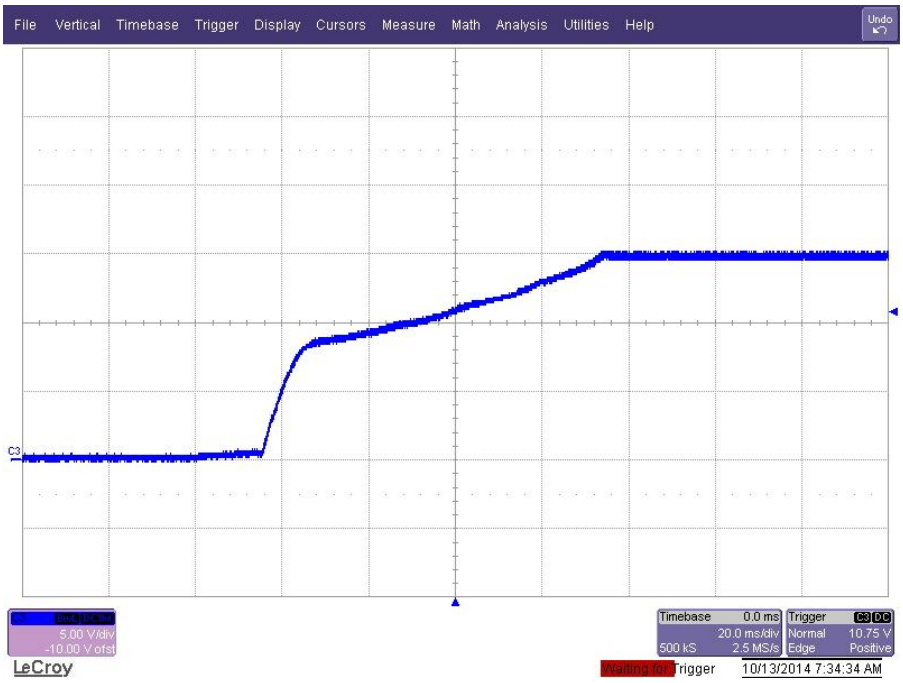


Spot analysis	Value
Amb Temperature	25.9°C

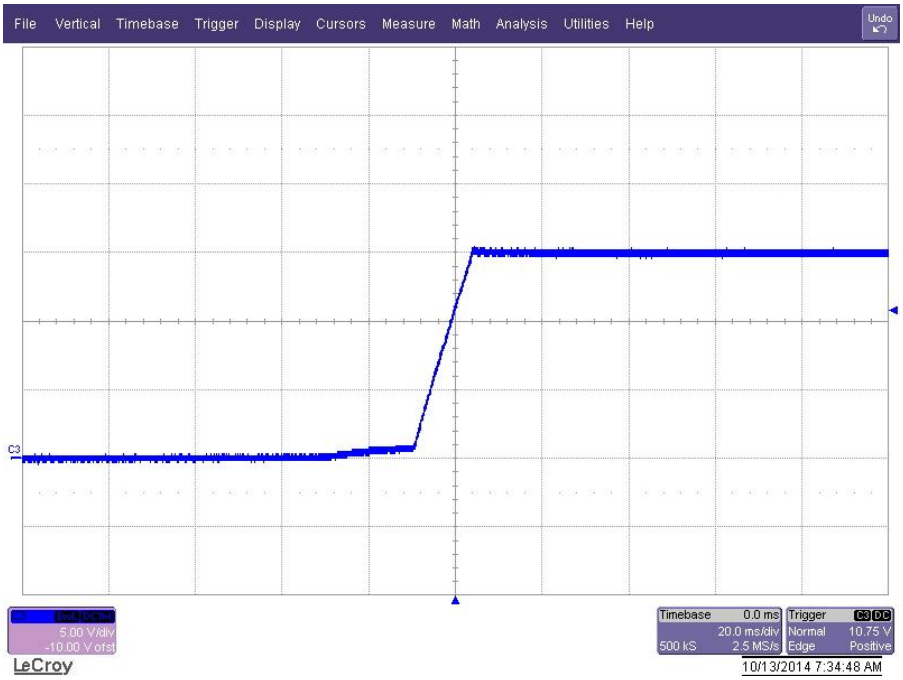
4 Startup Waveforms

The output voltages at startup with constant current load are shown in the images below.

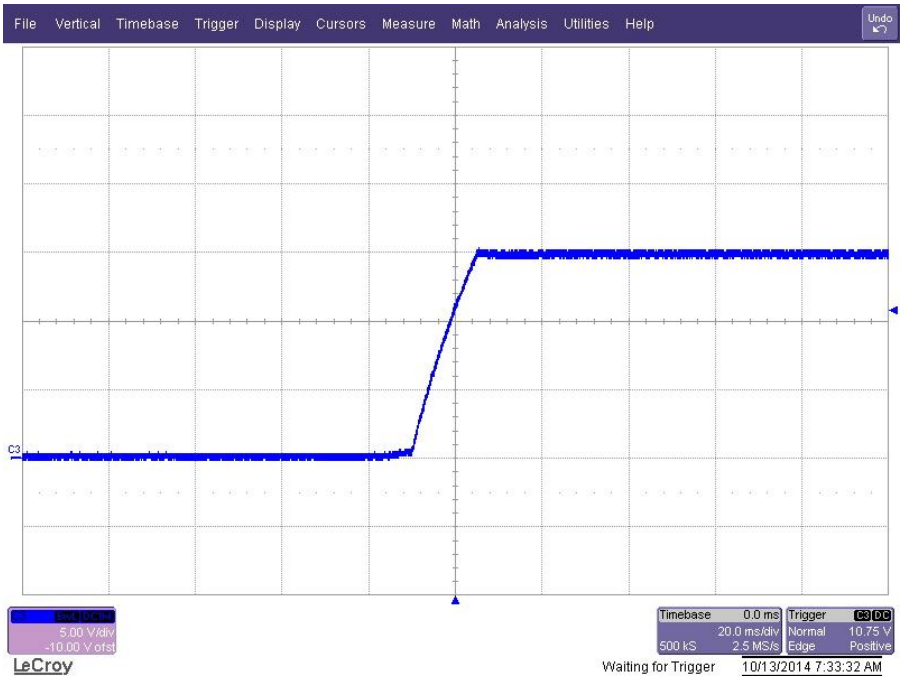
4.1 Start Up @ 85V_{AC}/60Hz: 15V/0.14A.



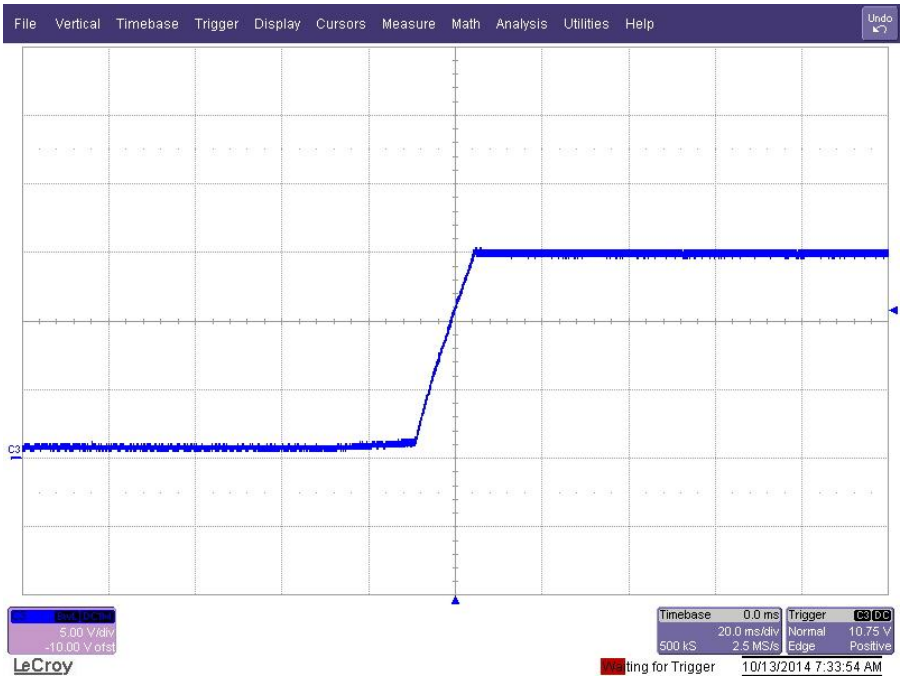
4.2 Start Up @ 85V_{AC}/60Hz: no load.



4.3 Start Up @ 230V_{AC}/50Hz: 15V/0.14A.



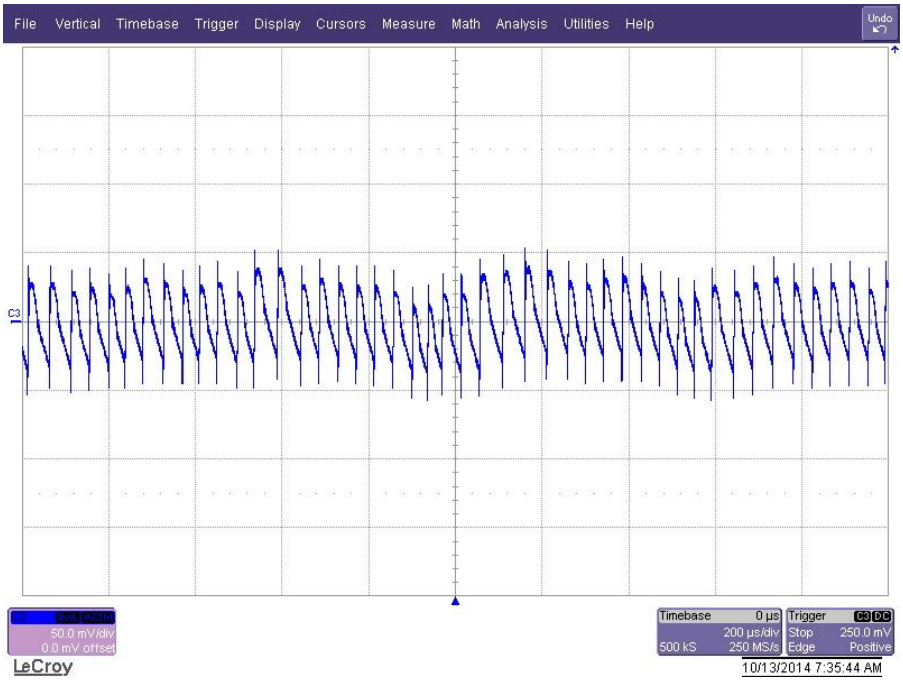
4.4 Start Up @ 230V_{AC}/50Hz: no load.



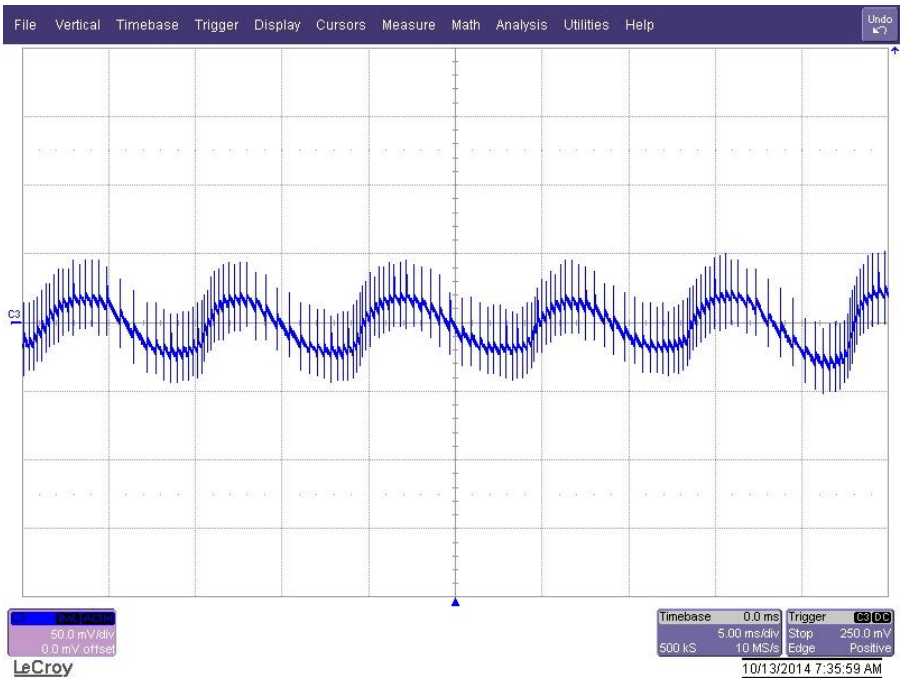
5 Output Ripple Voltages

The output ripple voltages are shown in the plots below.

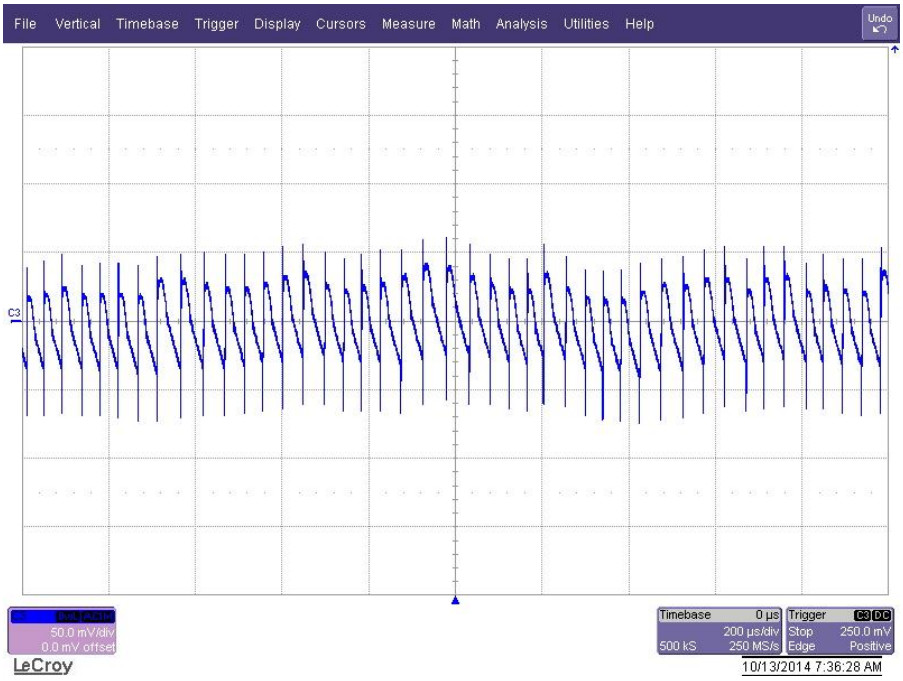
5.1 120V_{AC}/60Hz: 15V/0.14A.



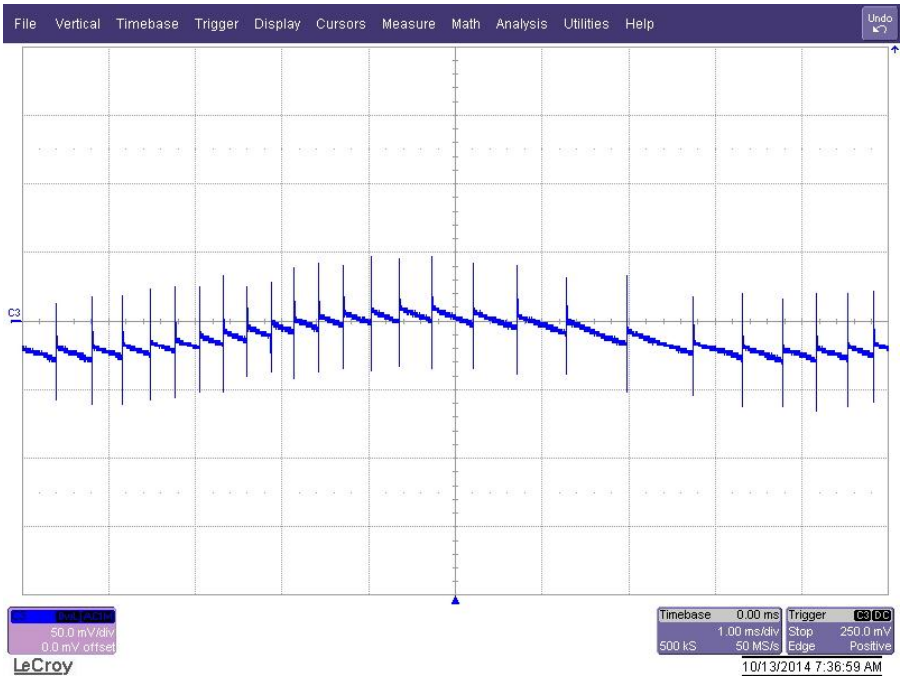
5.2 120V_{AC}/60Hz: No load.



5.3 230V_{AC}/50Hz: 15V/0.14A.



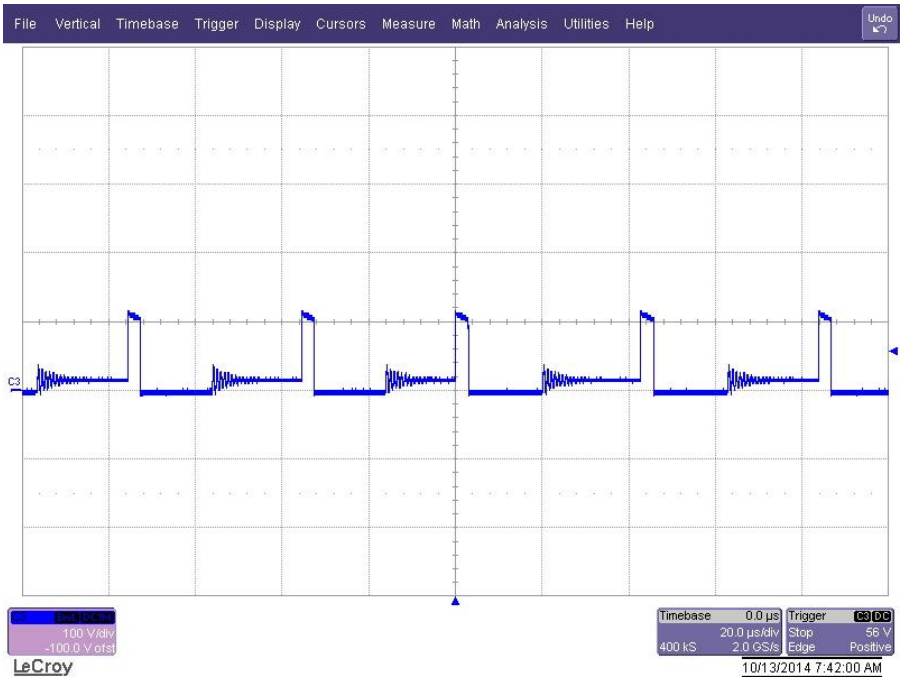
5.4 230V_{AC}/50Hz: No load.



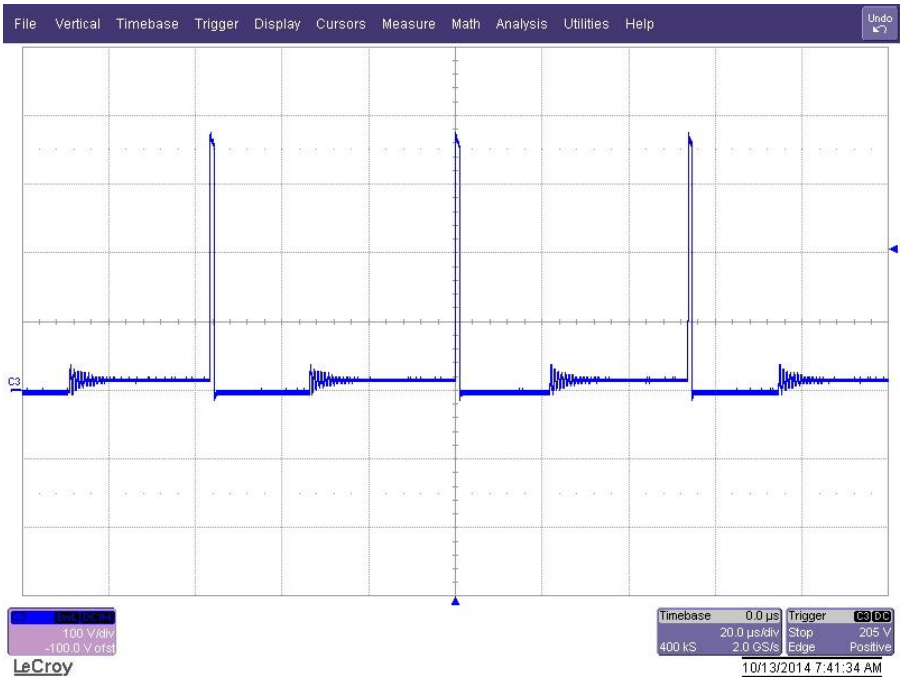
6 Switching Waveforms

The images below show key switching waveforms of PMP10767RevA. The waveforms are measured with 0.14A full load.

6.1 Diode D4 @ 85V_{AC}/60Hz



6.2 Diode D4 @ 264V_{AC}/50Hz



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