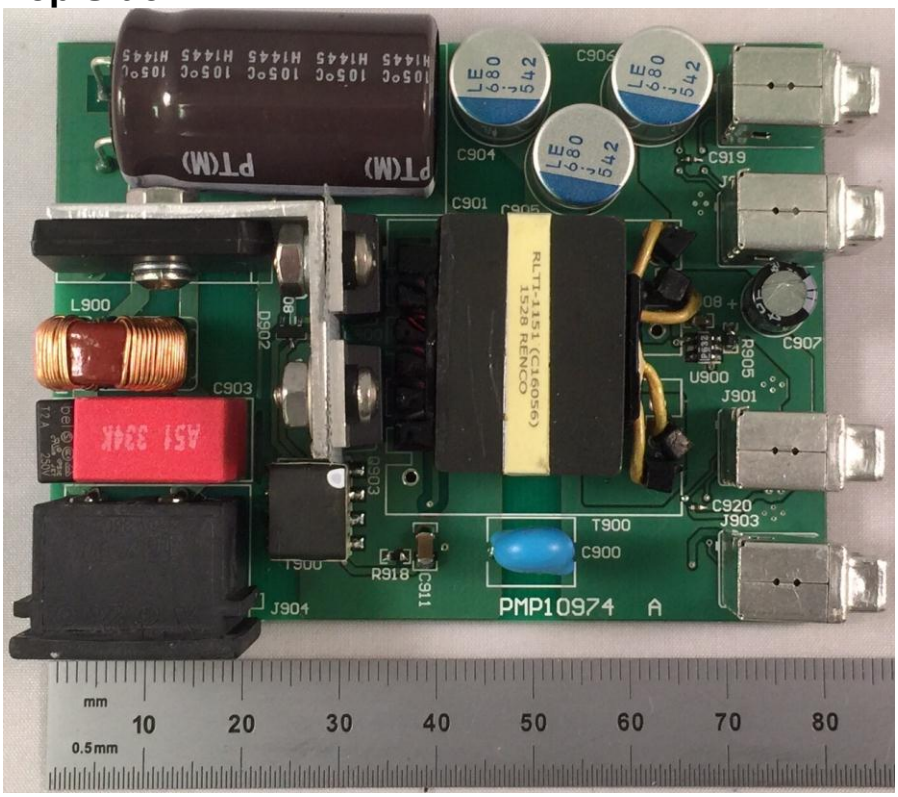
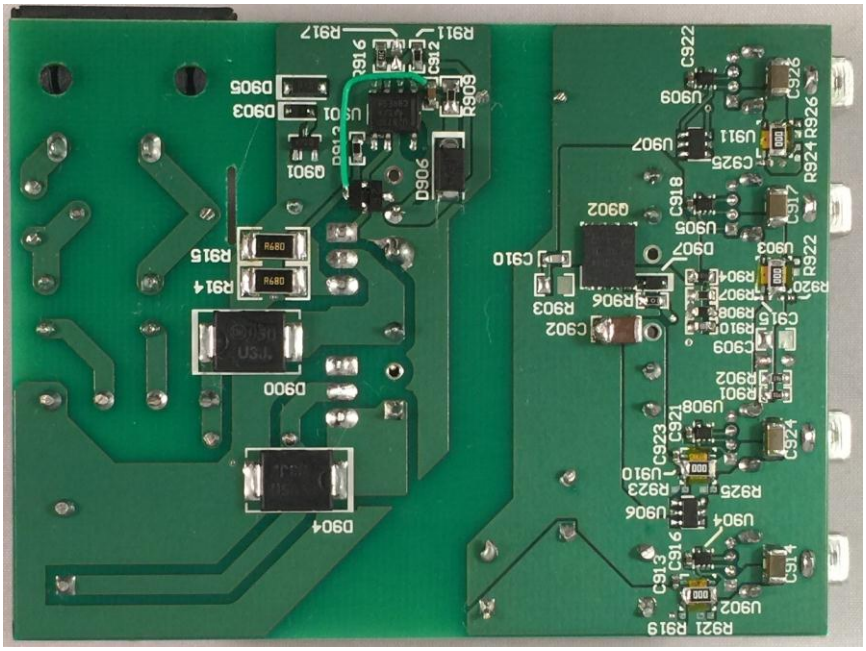
1 Photo

The photographs below show the PMP11232 Rev A assembly. This circuit was built on a PMP10974 Rev A PCB.

Top Side

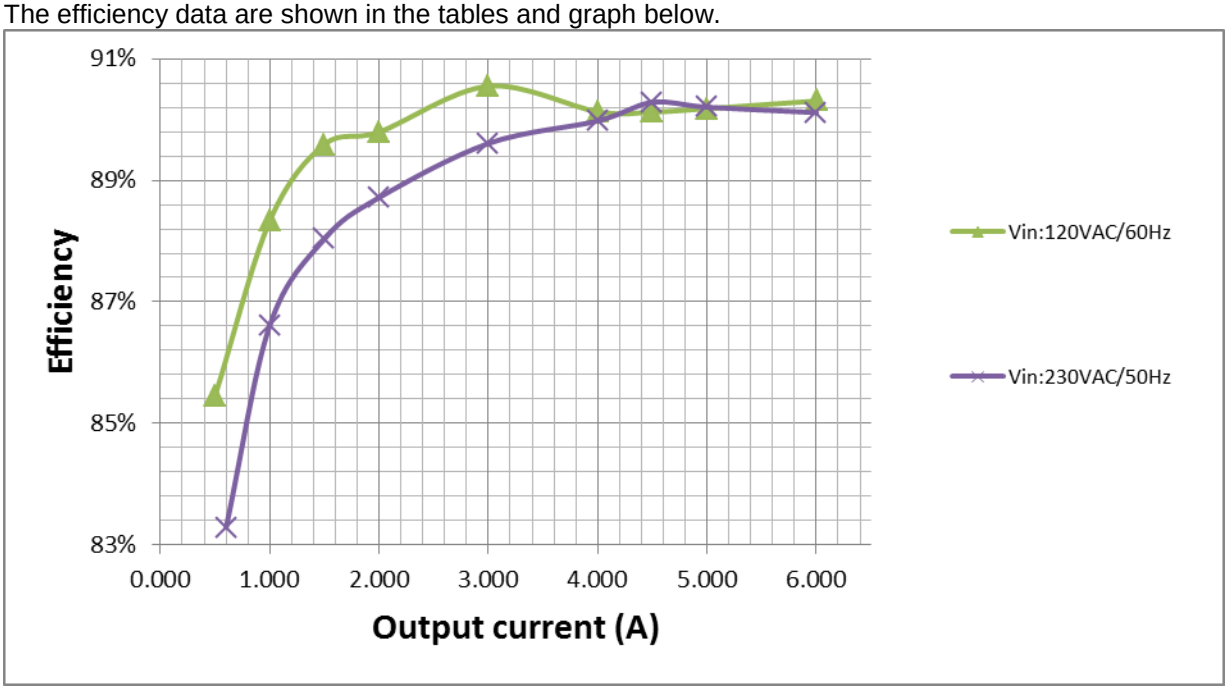


Bottom Side



2 Converter Efficiency

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



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

Vin(AC)	Iin(A)	Pin(W)	Vout(V)	Iout(A)	Pout(W)	Losses	Eff. (%)
119.98	0.520	34.280	5.151	6.010	30.958	3.322	90.31%
120.07	0.439	28.360	5.115	5.000	25.575	2.785	90.18%
120.11	0.398	25.460	5.099	4.500	22.946	2.515	90.12%
120.14	0.358	22.550	5.081	4.000	20.324	2.226	90.13%
120	0.274	16.718	5.046	3.000	15.138	1.580	90.55%
120.11	0.193	11.161	5.011	2.000	10.022	1.139	89.79%
120.16	0.150	8.363	4.995	1.500	7.493	0.871	89.59%
120.22	0.106	5.641	4.983	1.000	4.983	0.658	88.34%
120.29	0.061	2.904	4.973	0.499	2.482	0.422	85.45%
120.03	0.015	0.037	4.981	0.000	0.000	0.037	0.00%

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

Vin(AC)	Iin(A)	Pin(W)	Vo1(V)	Io1(A)	Pout(W)	Losses	Eff. (%)
230.1	0.325	34.270	5.147	6.000	30.882	3.388	90.11%
230.1	0.275	28.330	5.111	5.000	25.555	2.775	90.20%
230.2	0.250	25.390	5.094	4.500	22.923	2.467	90.28%
230.0	0.225	22.570	5.077	4.000	20.308	2.262	89.98%
230.0	0.175	16.887	5.044	3.000	15.132	1.755	89.61%
230.1	0.124	11.290	5.008	2.000	10.016	1.274	88.72%
230.1	0.098	8.504	4.991	1.500	7.487	1.018	88.04%
230.2	0.071	5.753	4.983	1.000	4.983	0.770	86.62%
230.2	0.051	3.610	5.011	0.600	3.007	0.603	83.29%
230.2	0.024	0.037	4.985	0.000	0.000	0.037	0.00%

Average Efficiency

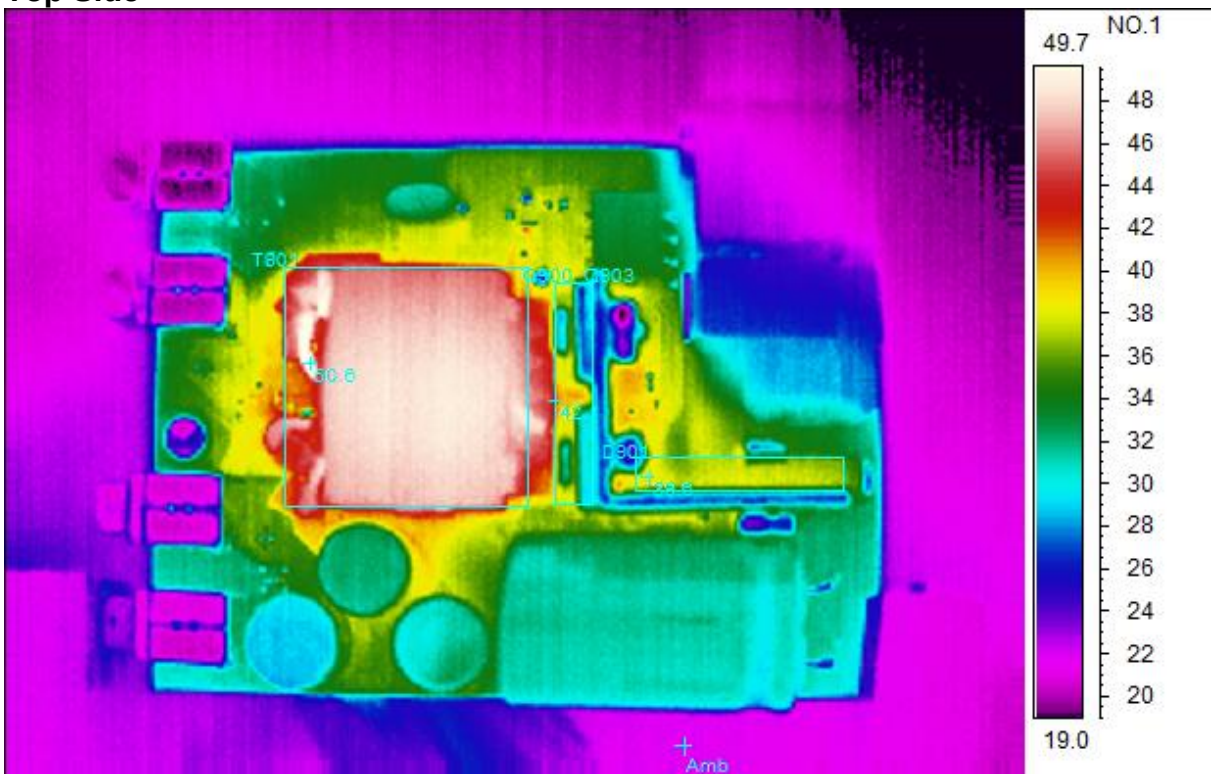
Vin	Pin(W)	Vout(V)	Iout(A)	Load	Avg Eff.
120VAC/60Hz	8.363	4.995	1.500	25%	90.14%
	16.718	5.046	3.000	50%	
	25.460	5.099	4.500	75%	
	34.280	5.151	6.010	100%	
230VAC/50Hz	8.504	4.991	1.500	25%	89.51%
	16.887	5.044	3.000	50%	
	25.390	5.094	4.500	75%	
	34.270	5.147	6.000	100%	

3 Thermal Images

The thermal images below show a top view and bottom view of the board. The ambient temperature was 20ºC with no forced air flow. The output was at 5V/30W full load.

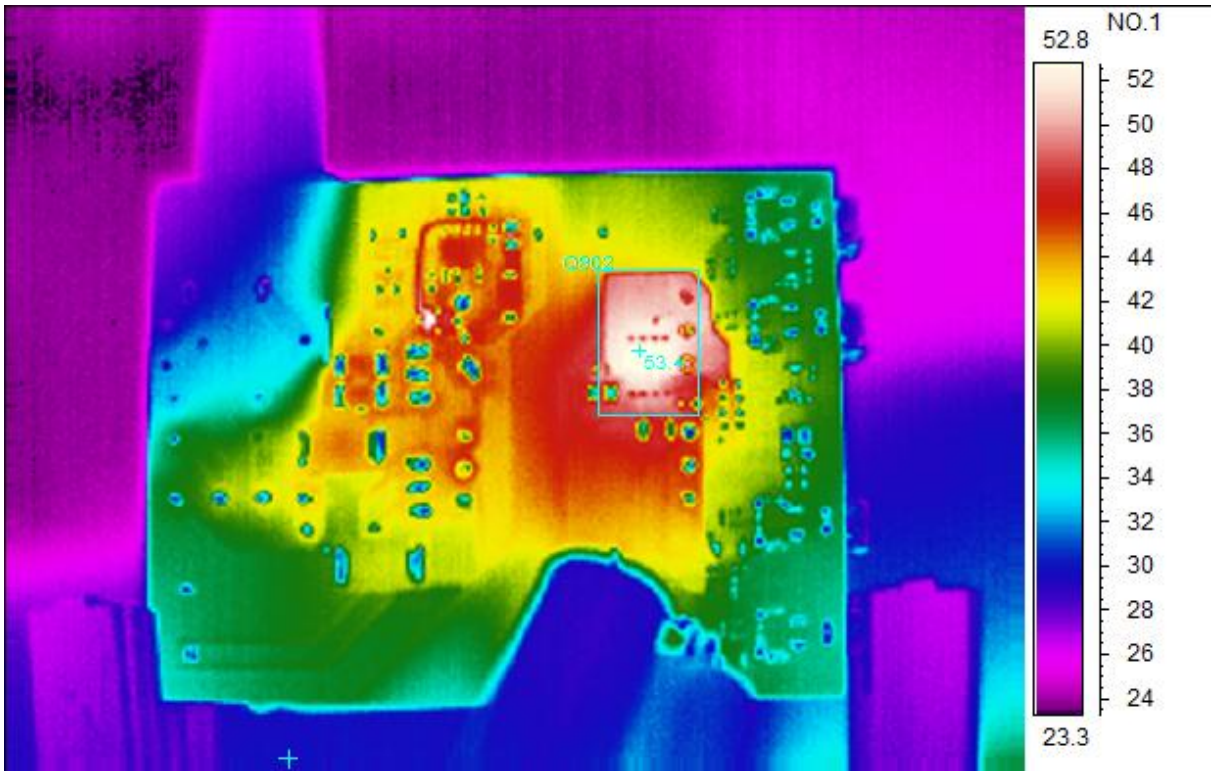
120V_{AC}/60Hz

Top Side



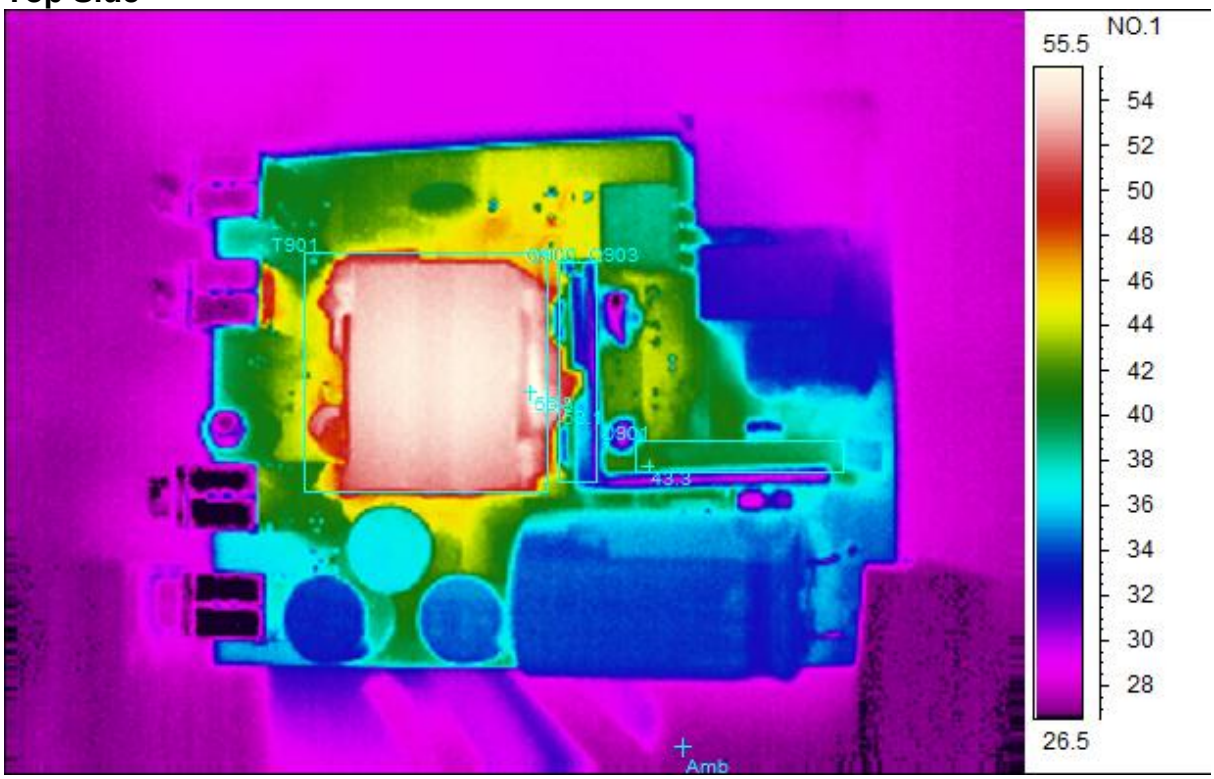
Spot analysis	Value
Amb Temperature	21.8°C
Area analysis	**Value**
T901Max	50.6°C
Q900, Q903Max	42.1°C
D901Max	39.6°C

120V$_{AC}$/60Hz
Bottom Side



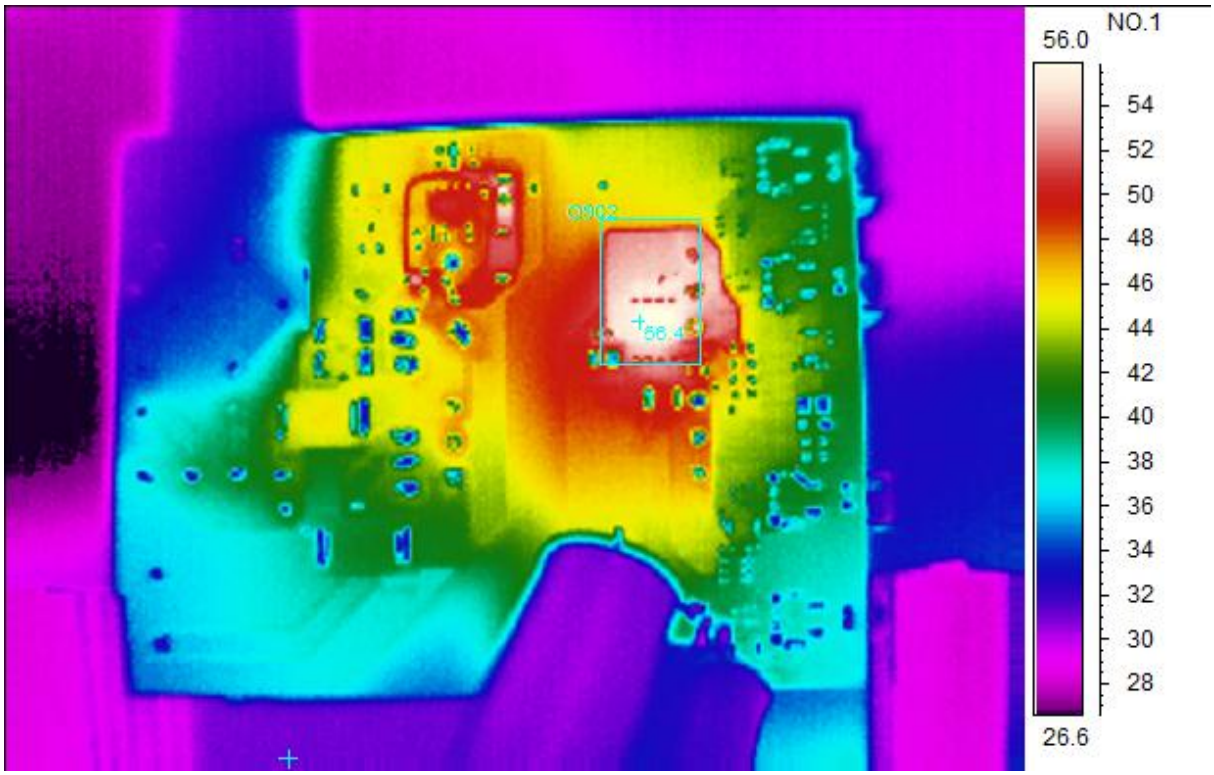
Spot analysis	Value
Amb Temperature	30.2°C
Area analysis	**Value**
Q902Max	53.4°C

230V_{AC}/50Hz
Top Side



Spot analysis	Value
Amb Temperature	27.2°C
Area analysis	**Value**
T901Max	56.8°C
Q900, Q903Max	53.1°C
D901Max	43.3°C

230V_{AC}/50Hz
Bottom Side

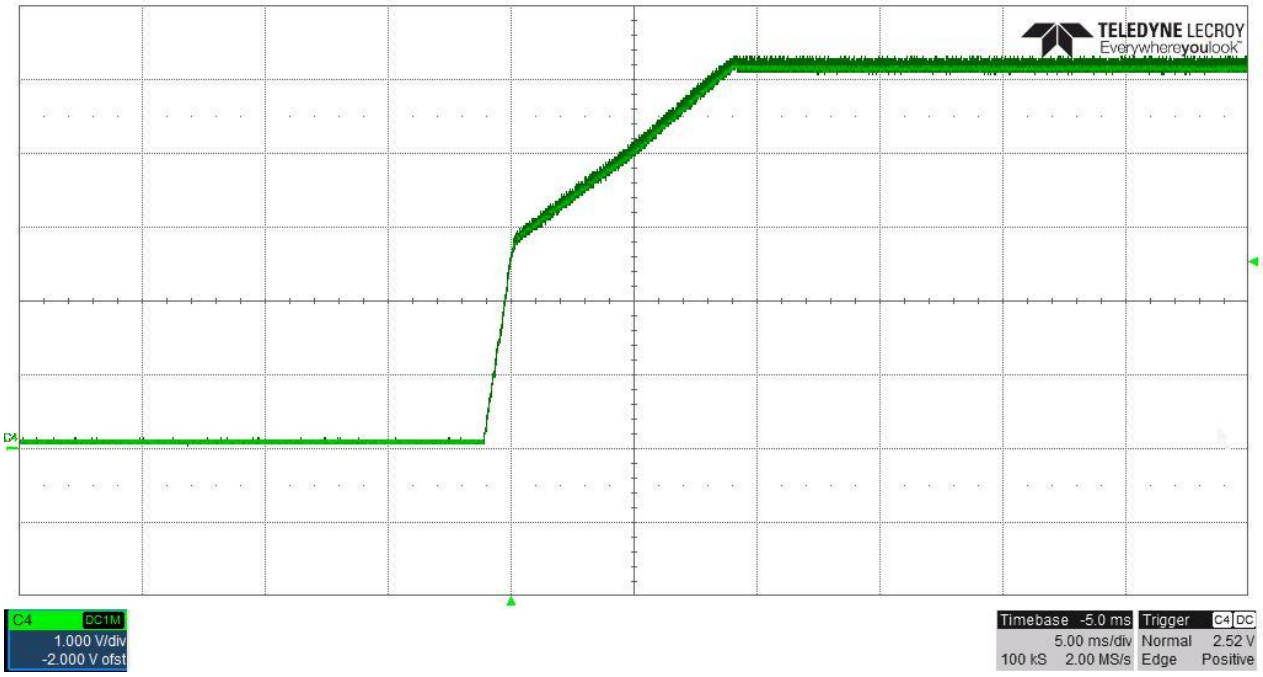


Spot analysis	Value
Amb Temperature	31.5°C
Area analysis	**Value**
Q902Max	56.4°C

4 Startup

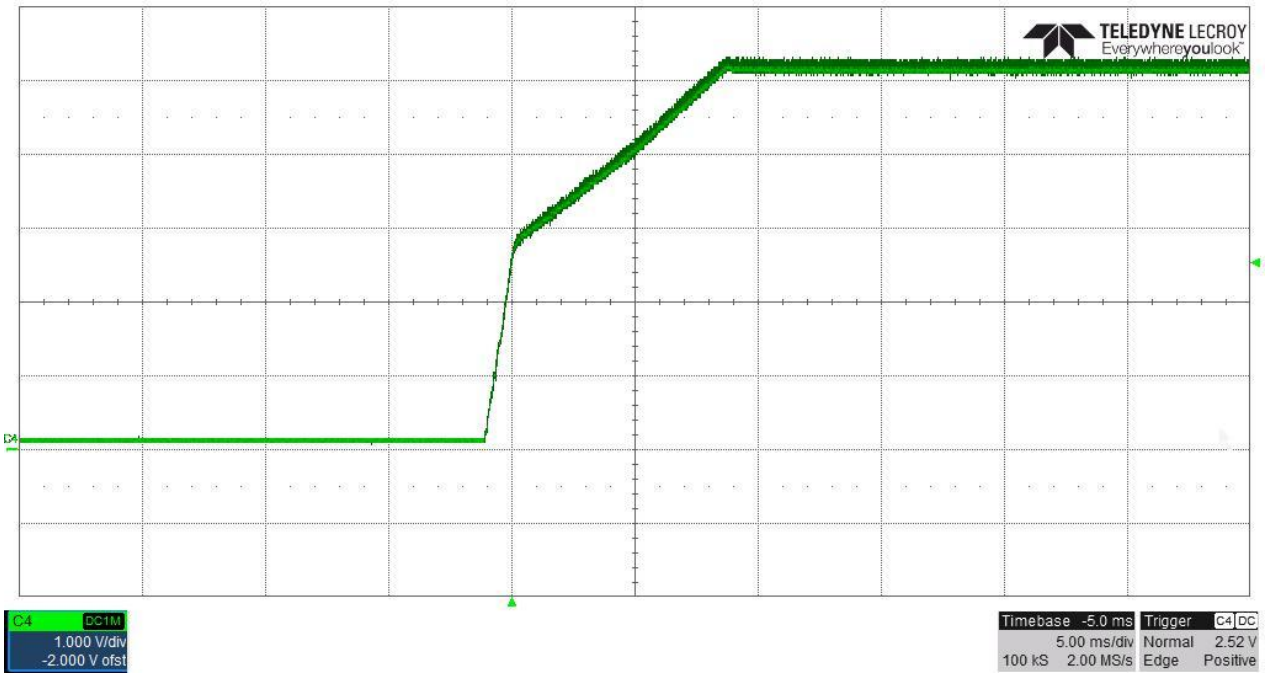
The output voltages at startup are shown in the images below.

4.1 Startup @ 120V_{AC}/60Hz: 5V/6A at C907.

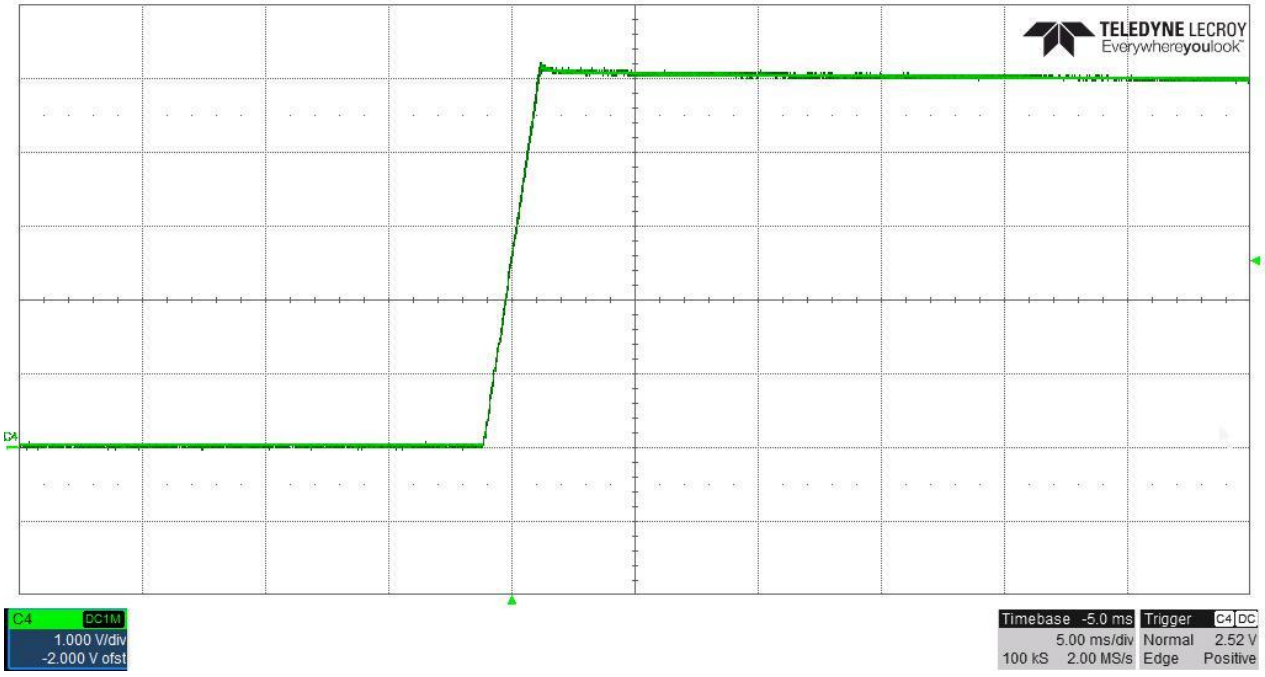


4.2 Startup @ 120V_{AC}/60Hz: no load.

4.3 Startup @ 230V_{AC}/50Hz: 5V/6A at C907.

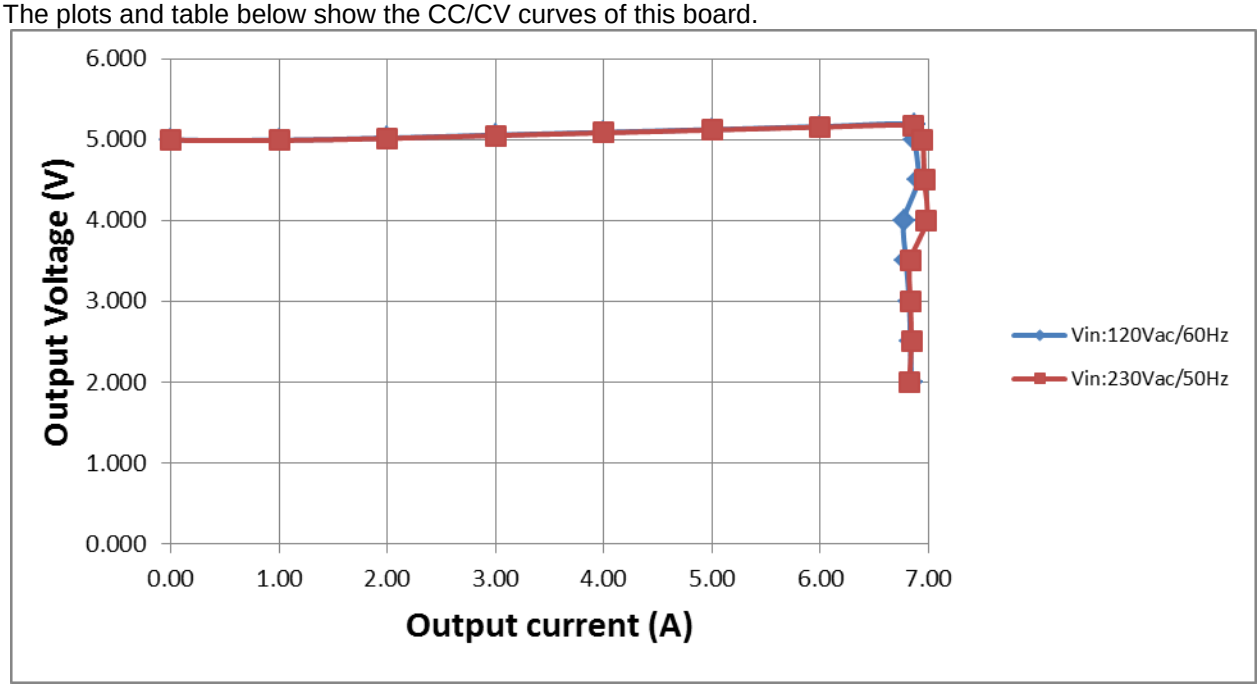


4.4 Startup @ 230V_{AC}/50Hz: no load.



5 Constant Current/ Constant Coltage

The plots and table below show the CC/CV curves of this board.

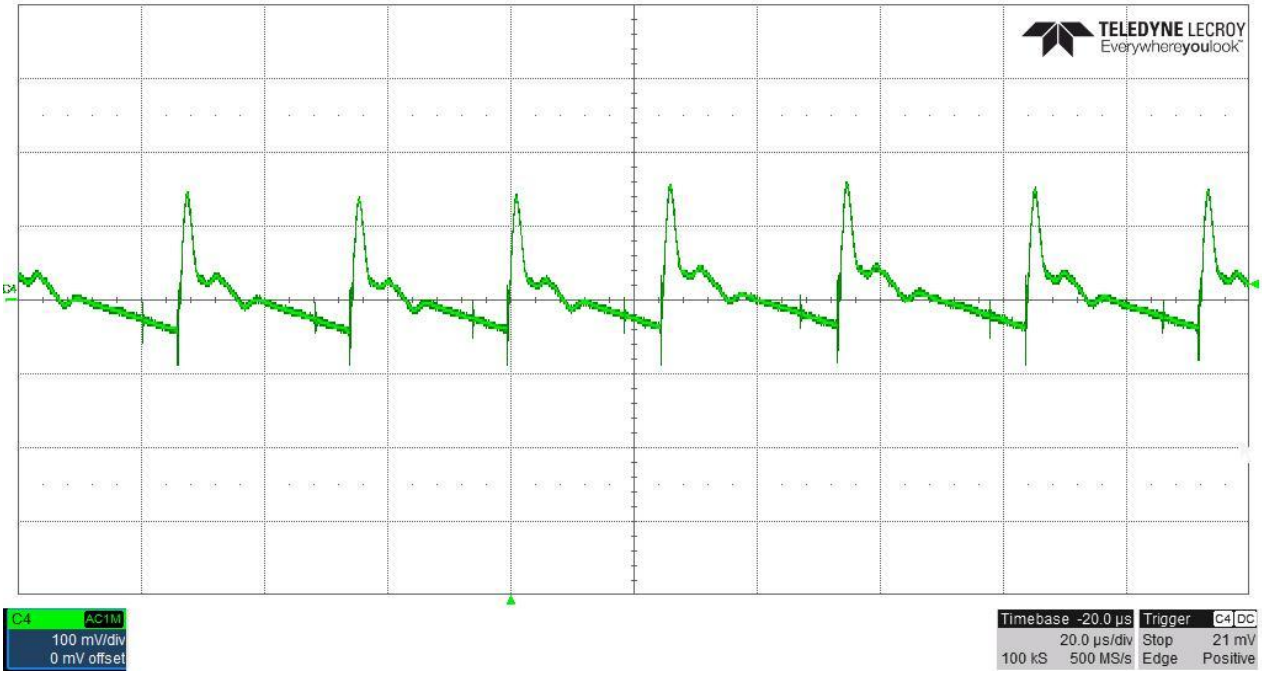


120VAC/60Hz		230VAC/50Hz	
Vout	Iout	Vout	Iout
4.992	0.000	4.992	0.000
4.992	1.000	4.988	1.000
5.019	2.000	5.014	2.000
5.055	3.000	5.050	3.000
5.090	4.000	5.083	4.000
5.124	5.000	5.118	5.000
5.161	6.000	5.154	6.000
5.188	6.870	5.168	6.860
5.000	6.870	5.000	6.940
4.500	6.900	4.500	6.960
4.000	6.770	4.000	6.980
3.500	6.790	3.500	6.830
3.000	6.820	3.000	6.830
2.500	6.830	2.500	6.840
2.000	6.840	2.000	6.820

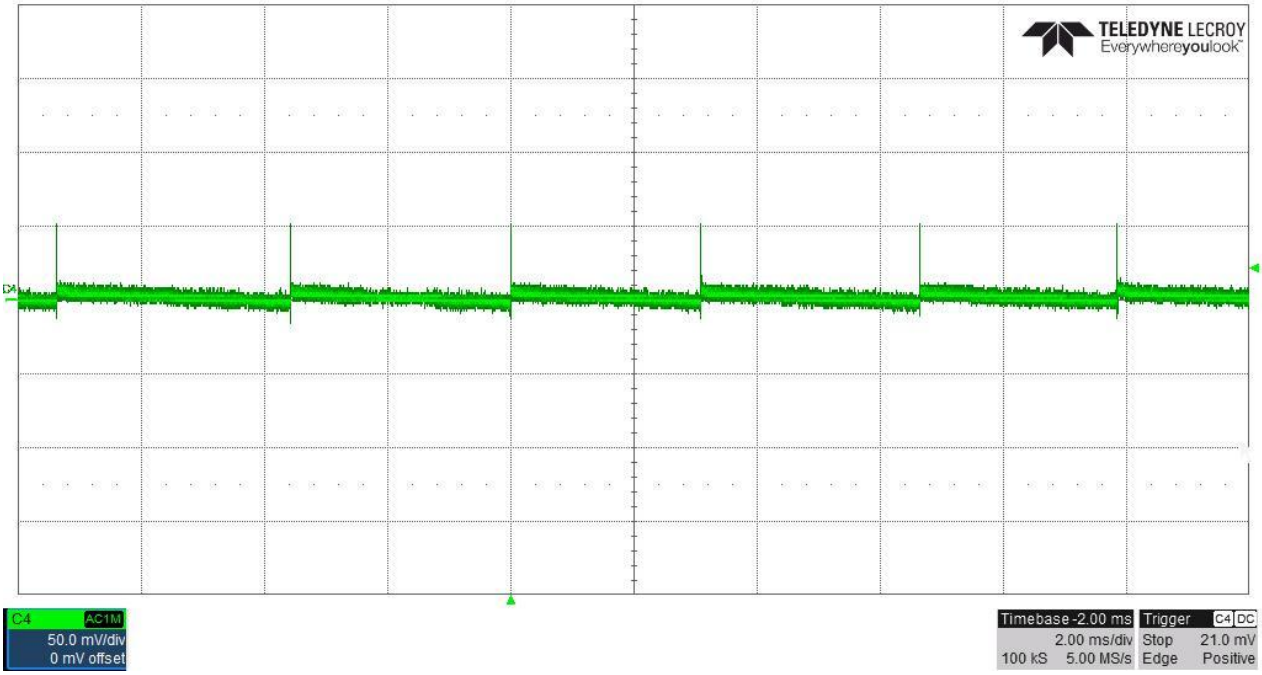
6 Output Ripple Voltages

The output ripple voltage is shown in the plots below.

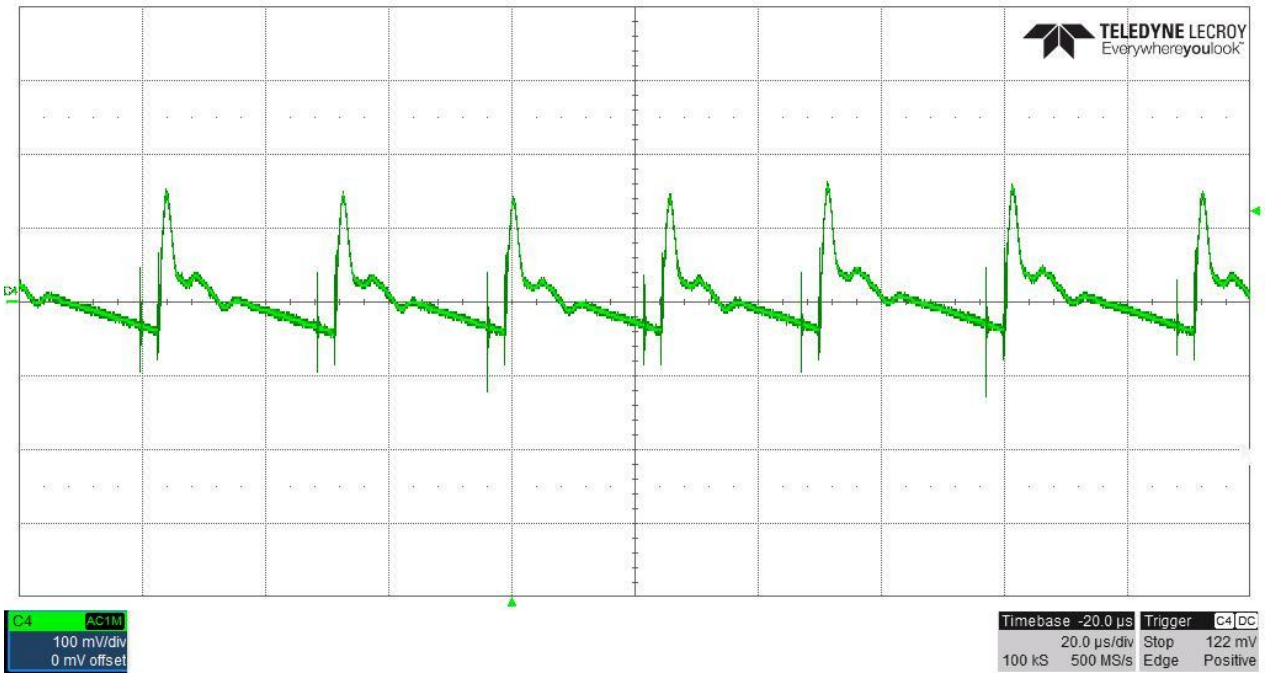
6.1 120V_{AC}/60Hz: 5V/6A at C907.



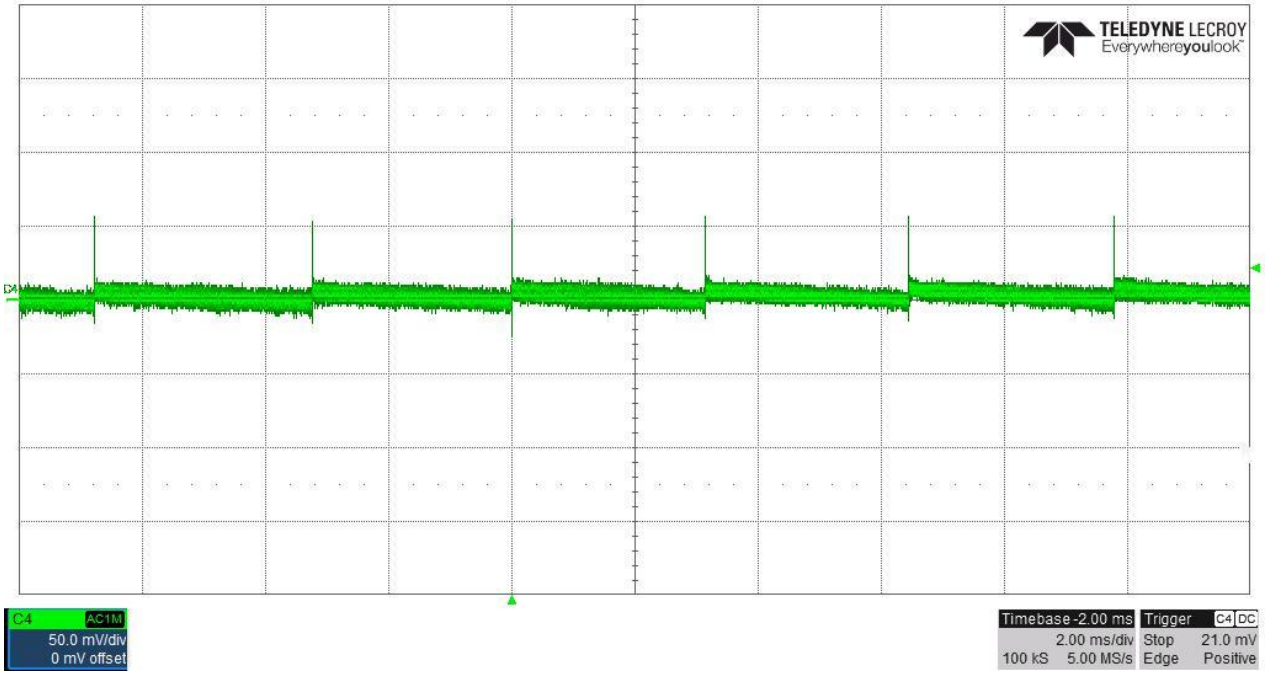
6.2 120V_{AC}/60Hz: no Load.



6.3 230V_{AC}/50Hz: 5V/6A at C907



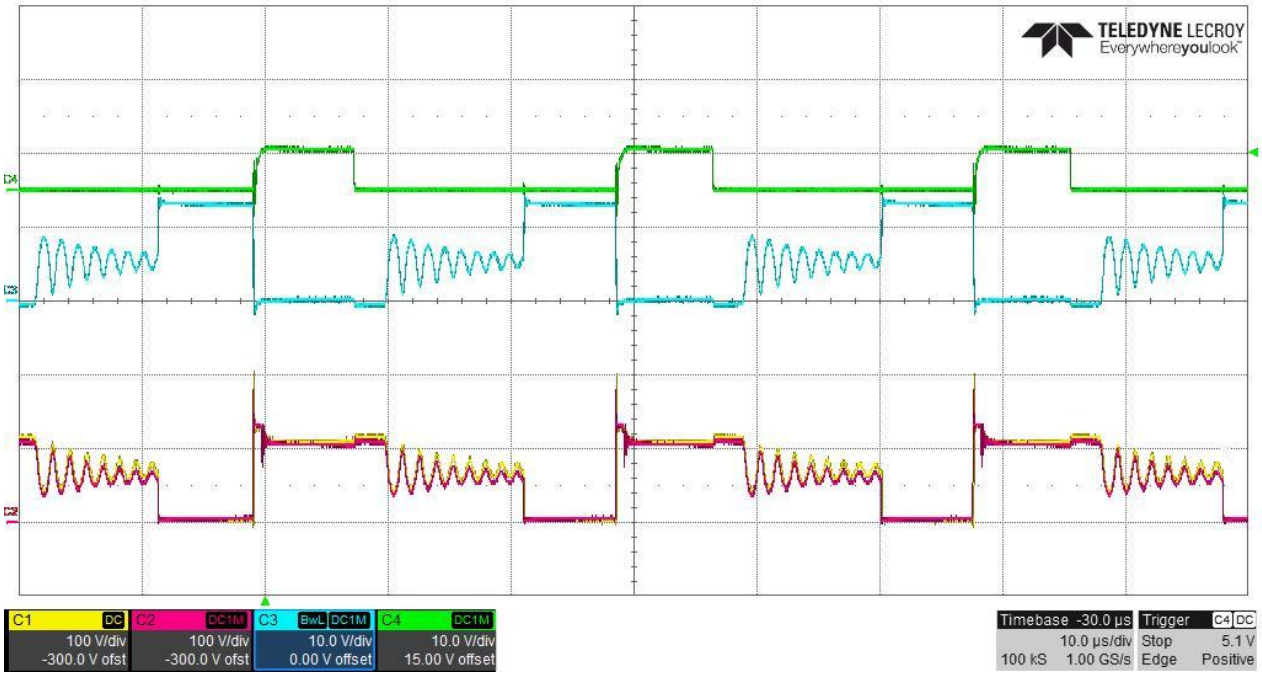
6.4 230V_{AC}/50Hz: no Load.

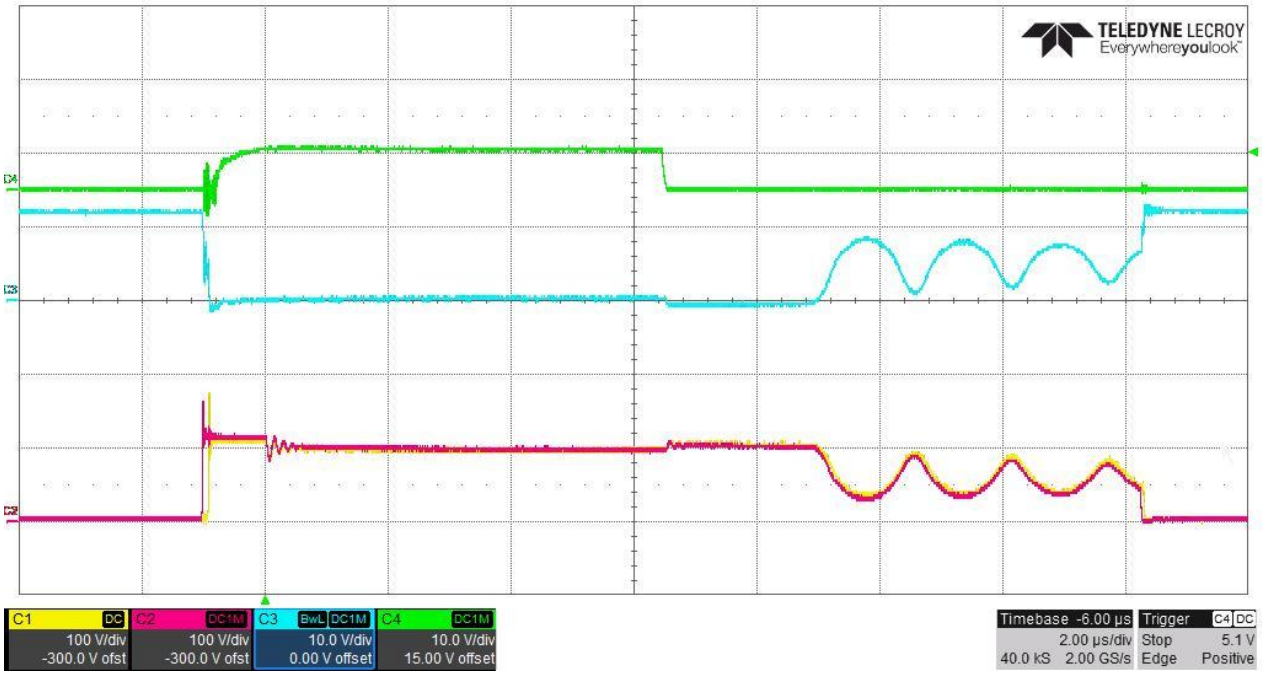


7 Switching Waveforms

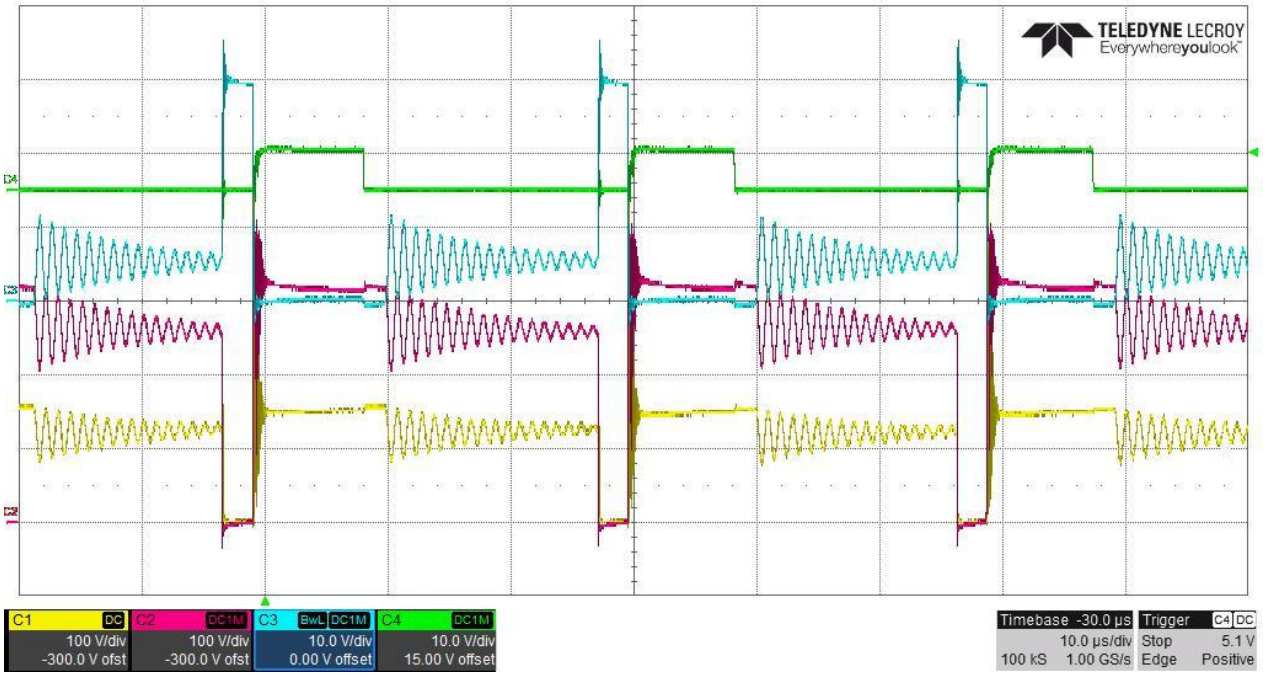
The images below show key switching waveforms of this board. The waveforms are measured with 5V/30W full load. CH1: V_{DS} (Q900), CH2: V_D to GND (Q903), CH3: V_{DS} (Q902), CH4: V_{GS}(Q902).

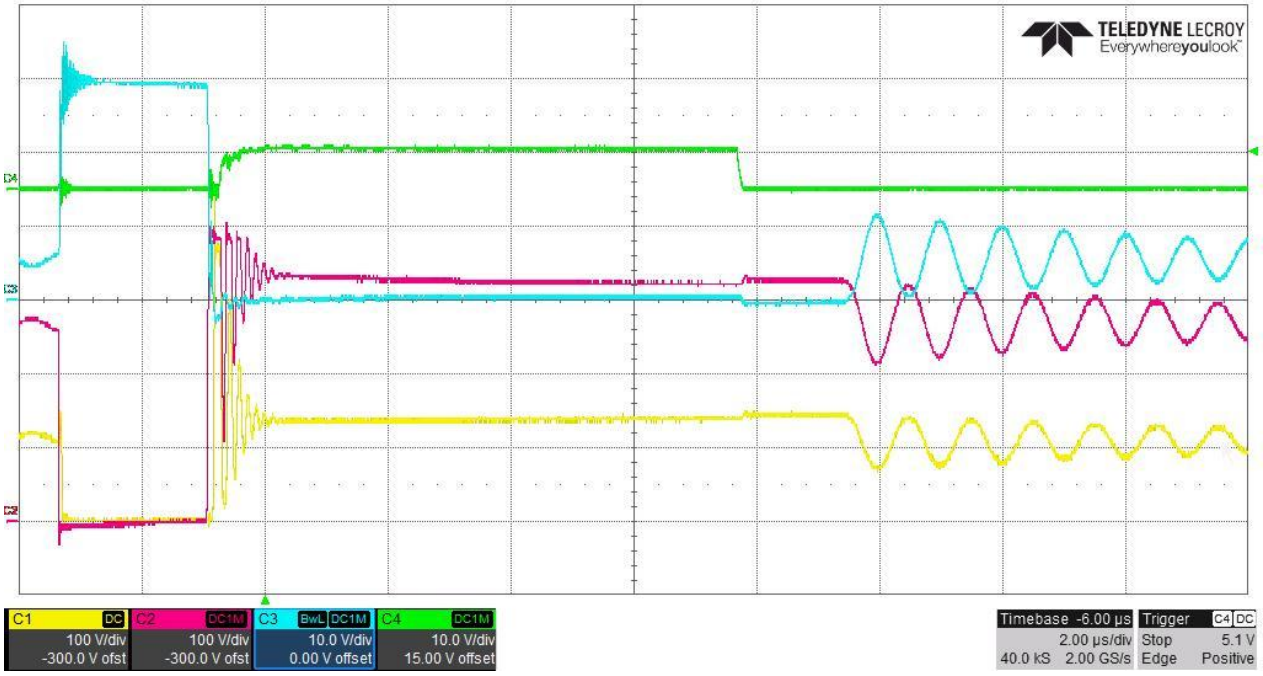
7.1 85V_{AC}/60Hz





7.2 $264V_{AC}/50Hz$



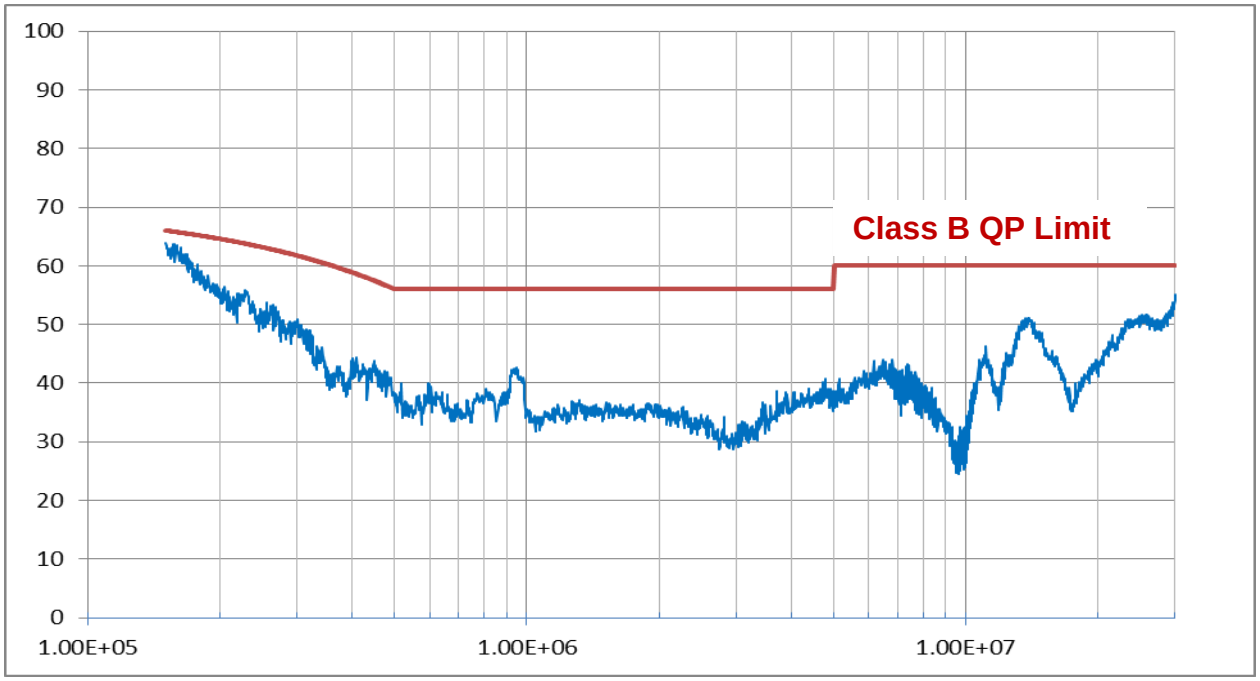


8 Conducted EMI:

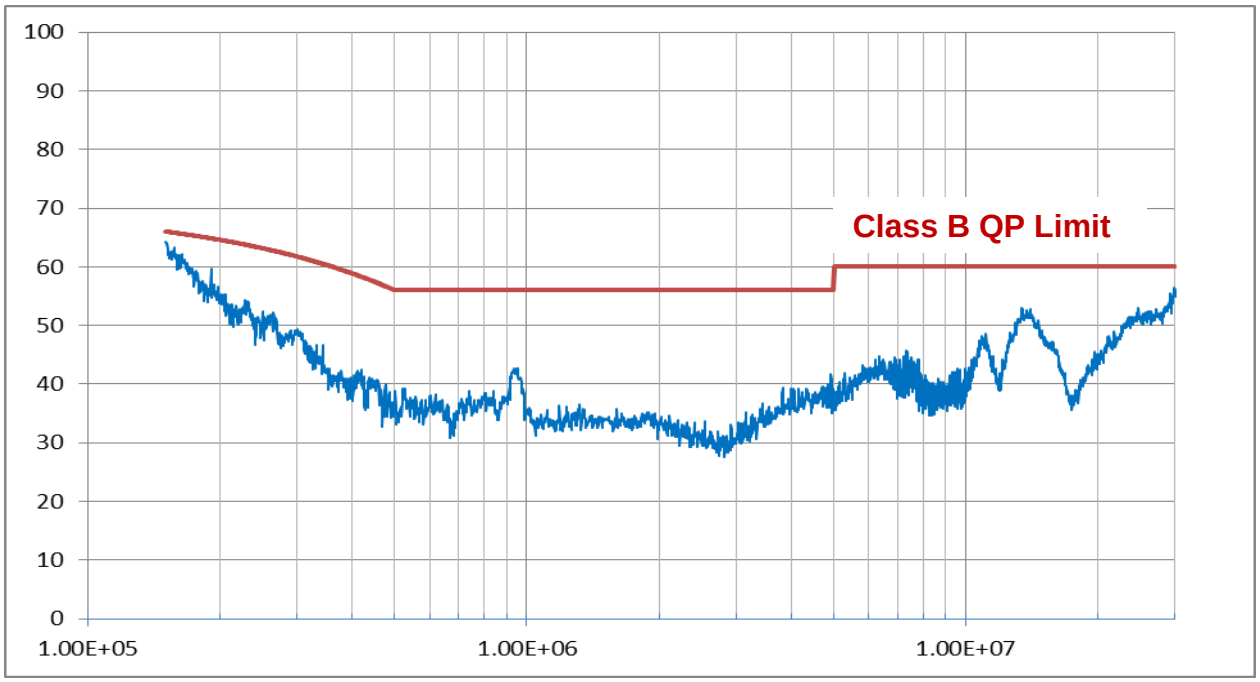
Conducted EMI of PMP11232 Rev A was tested with 5V/5.8A output. The following curves show the results of **peak** scan with maximum hold.

120VAC/60Hz

Line

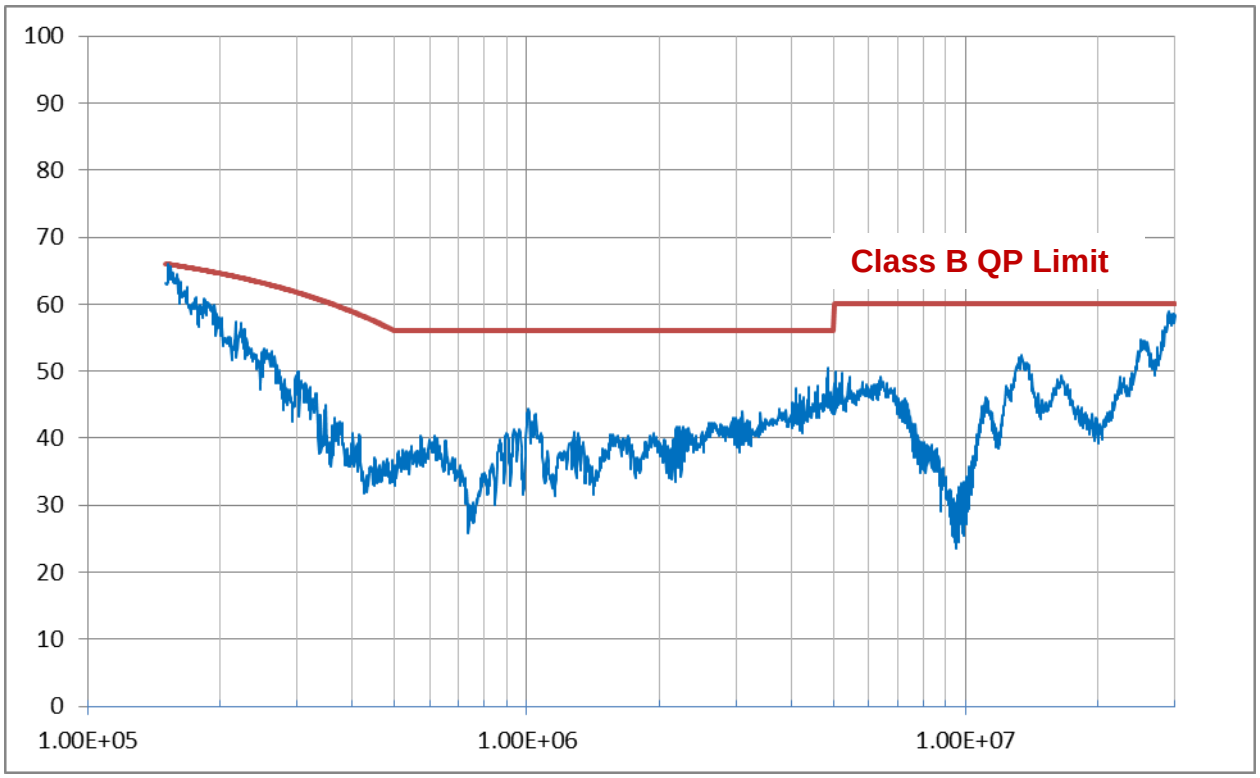


Neutral

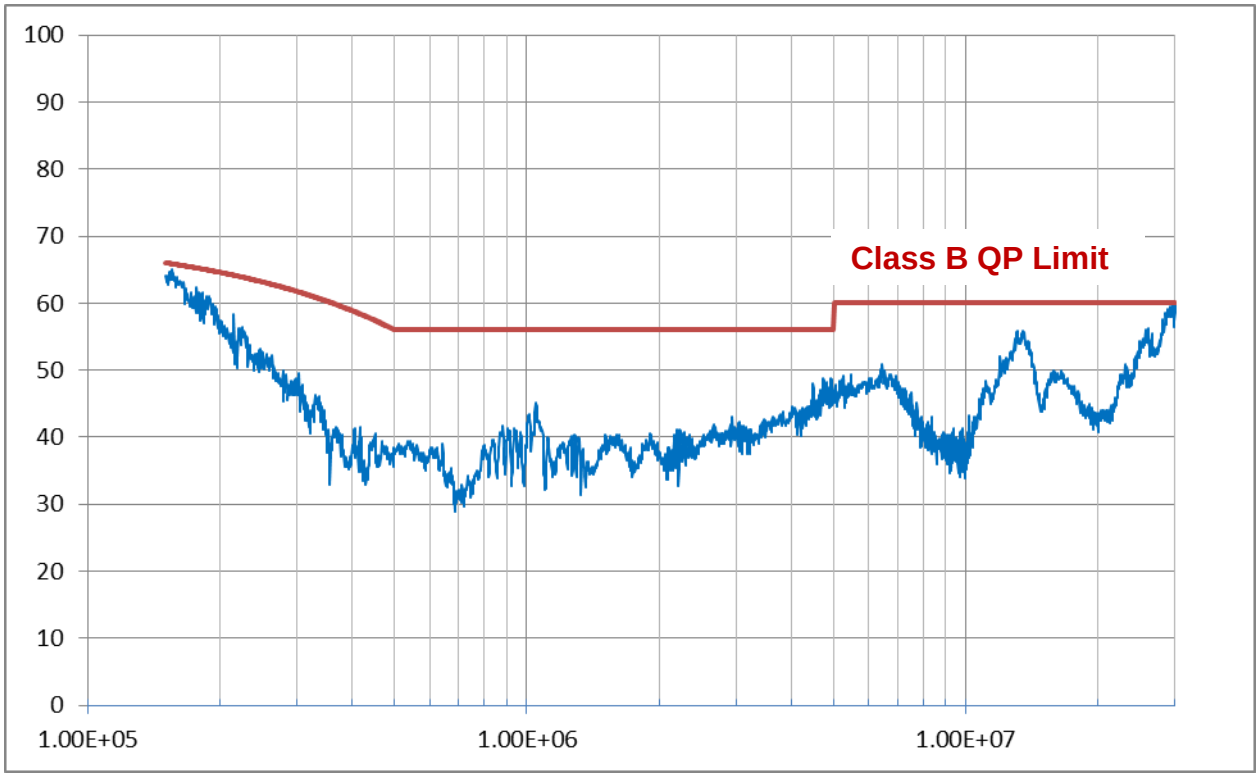


230VAC/50Hz

Line



Neutral



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