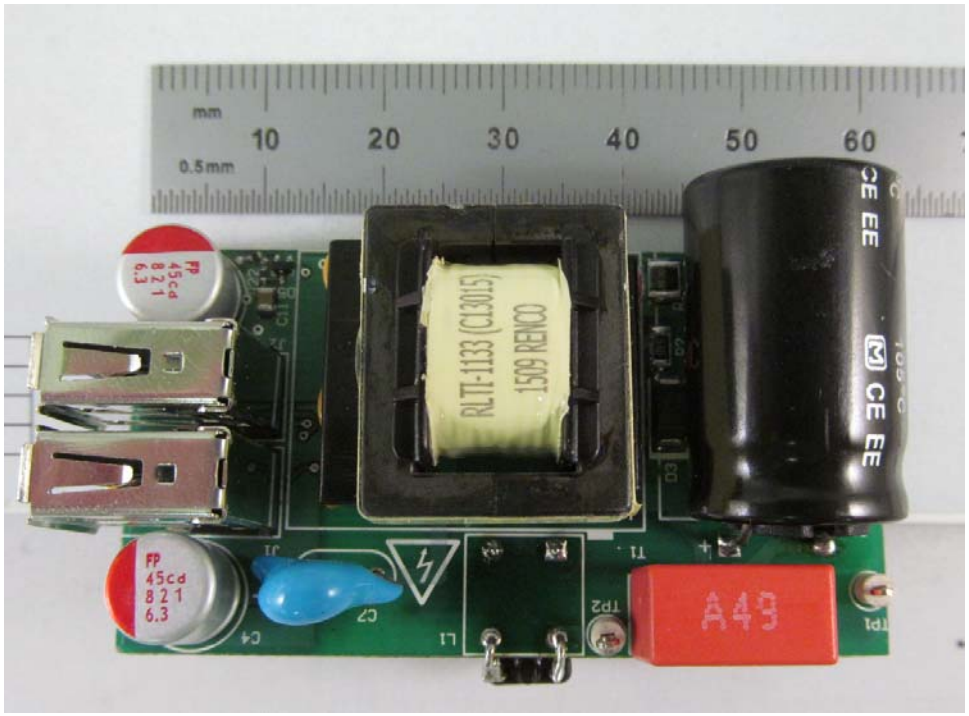
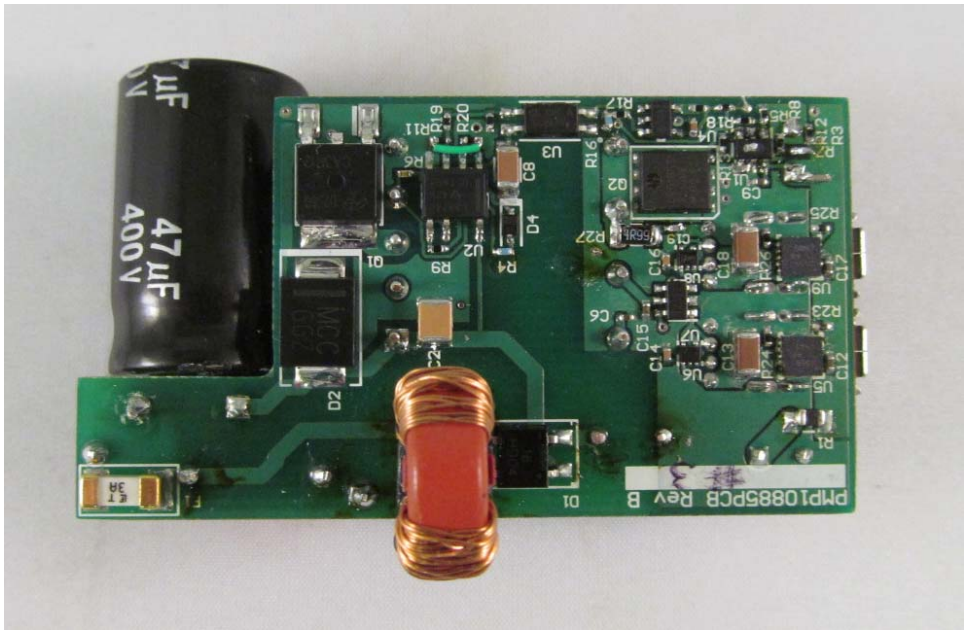
1 Photos

The photographs below show the PMP10885 Rev C prototype assembly. This circuit was built using a PMP10855 Rev B PCB.





2 Standby Power

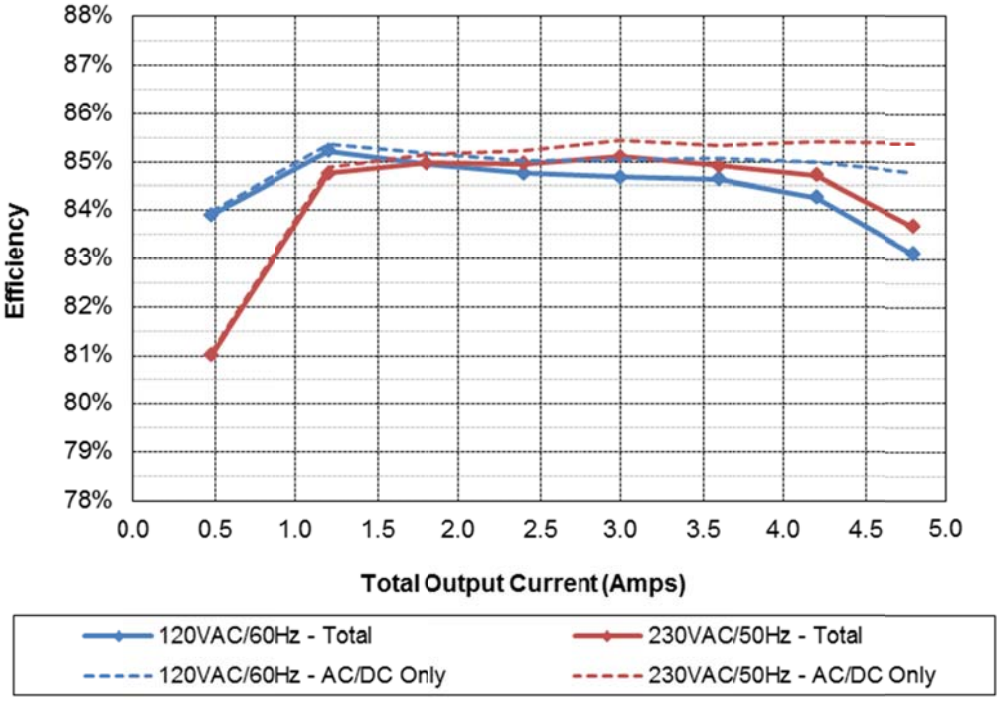
Measured with cable unplugged

No Load	Pin AC (W)
120VAC/60Hz	0.058
230VAC/50Hz	0.068

3 Efficiency

3.1 Efficiency

The efficiency measurements below were measured from the AC input to the output.



AC-DC Average Efficiency

Vin	Pin	Vout	Iout	Load	Efficiency	Avg. Eff.
120VAC/60Hz	2.86	5.01	0.480	10%	83.97%	
	7.03	5.00	1.200	25%	85.35%	**85.06%**
	14.12	5.00	2.400	50%	85.02%	
	21.18	5.01	3.600	75%	85.07%	
	28.35	5.01	4.800	100%	84.79%	
230VAC/50Hz	2.96	5.00	0.480	10%	81.08%	
	7.07	5.00	1.200	25%	84.88%	**85.21%**
	14.09	5.00	2.400	50%	85.23%	
	21.11	5.00	3.600	75%	85.34%	
	28.15	5.01	4.800	100%	85.39%	

Total Average Efficiency

Vin	Pin	Vout	Iout	Load	Efficiency	Avg. Eff.
120VAC/60Hz	2.86	5.00	0.000	10%	83.91%	
	7.03	5.00	0.480	25%	85.22%	**84.43%**
	14.12	4.99	1.800	50%	84.75%	
	21.18	4.98	3.000	75%	84.64%	
	28.35	4.93	4.200	100%	83.11%	
230VAC/50Hz	2.96	4.99	0.000	10%	81.02%	
	7.07	4.99	0.000	25%	84.75%	**84.57%**
	14.09	4.99	0.000	50%	84.96%	
	21.11	4.98	0.000	75%	84.92%	
	28.15	4.93	0.000	100%	83.66%	

3.2 Raw Efficiency Data

120VAC/60Hz

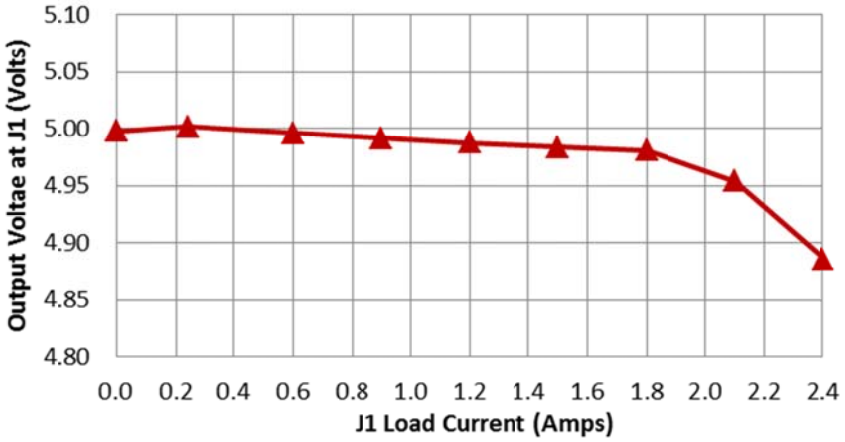
J1 Port		J2 Port		AC/DC (J1 + J2)						Total			AC/DC Only		
Iout	Vout	Iout	Vout	Iout	Vout	Vin	Iin	Pin	PF	Pout	Losses	Efficiency	Pout	Losses	Efficiency
0.000	5.00	0.000	5.00	0.000	5.00	120.1	0.008	0.058			0.058			0.06	
0.240	5.00	0.240	5.00	0.480	5.01	120.1	0.075	2.86	0.32	2.40	0.46	83.9%	2.40	0.46	84.0%
0.600	5.00	0.600	5.00	1.200	5.00	120.1	0.156	7.03	0.38	5.99	1.04	85.2%	6.00	1.03	85.4%
0.900	4.99	0.900	4.99	1.800	5.00	120.1	0.213	10.57	0.41	8.98	1.59	85.0%	9.01	1.57	85.2%
1.200	4.99	1.200	4.99	2.400	5.00	120.1	0.267	14.12	0.44	11.97	2.15	84.8%	12.01	2.11	85.0%
1.500	4.98	1.500	4.98	3.000	5.00	120.1	0.317	17.65	0.46	14.95	2.71	84.7%	15.01	2.64	85.0%
1.800	4.98	1.800	4.98	3.600	5.01	120.1	0.366	21.18	0.48	17.93	3.25	84.6%	18.02	3.16	85.1%
2.100	4.95	2.100	4.97	4.200	5.01	120.1	0.413	24.74	0.50	20.85	3.89	84.3%	21.03	3.71	85.0%
2.400	4.89	2.400	4.93	4.800	5.01	120.1	0.460	28.35	0.51	23.56	4.79	83.1%	24.04	4.31	84.8%

230VAC/50Hz

J1 Port		J2 Port		AC/DC (J1 + J2)						Total			AC/DC Only		
Iout	Vout	Iout	Vout	Iout	Vout	Vin	Iin	Pin	PF	Pout	Losses	Efficiency	Pout	Losses	Efficiency
0.000	5.01	0.000	5.01	0.000	5.01	230.1	0.019	0.068						0.07	
0.240	5.00	0.240	4.99	0.480	5.00	230.1	0.051	2.96	0.25	2.40	0.56	81.0%	2.40	0.56	81.1%
0.600	4.99	0.600	4.99	1.200	5.00	230.1	0.102	7.07	0.30	5.99	1.08	84.8%	6.00	1.07	84.9%
0.900	4.99	0.900	4.99	1.800	5.00	230.1	0.146	10.57	0.32	8.98	1.59	85.0%	9.00	1.57	85.2%
1.200	4.99	1.200	4.99	2.400	5.00	230.1	0.187	14.09	0.32	11.97	2.12	85.0%	12.00	2.08	85.2%
1.500	4.98	1.500	4.98	3.000	5.00	230.1	0.224	17.57	0.34	14.95	2.62	85.1%	15.01	2.56	85.4%
1.800	4.98	1.800	4.98	3.600	5.00	230.1	0.258	21.11	0.36	17.93	3.18	84.9%	18.01	3.10	85.3%
2.100	4.95	2.100	4.97	4.200	5.01	230.0	0.288	24.61	0.37	20.85	3.76	84.7%	21.02	3.59	85.4%
2.400	4.88	2.400	4.93	4.800	5.01	230.0	0.317	28.15	0.39	23.55	4.60	83.7%	24.04	4.11	85.4%

4 Regulation

Plotted from efficiency data.

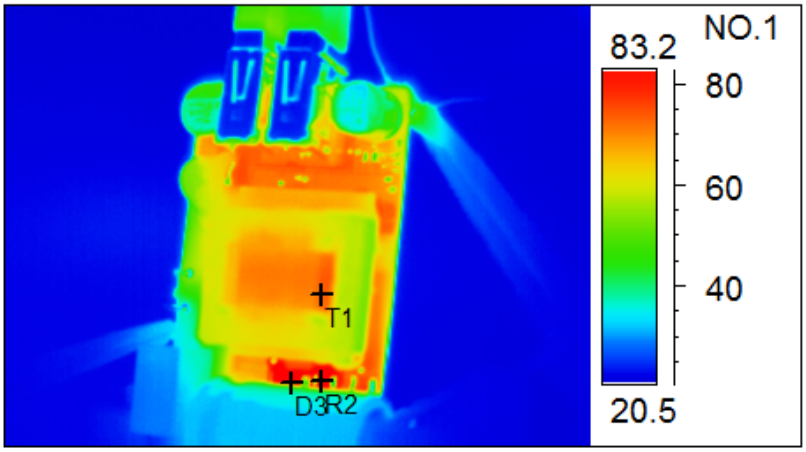


5 Thermal Images

The thermal images below show the output loaded with 4.8A. The ambient temperature was 25ºC.

5.1 120VAC/60Hz

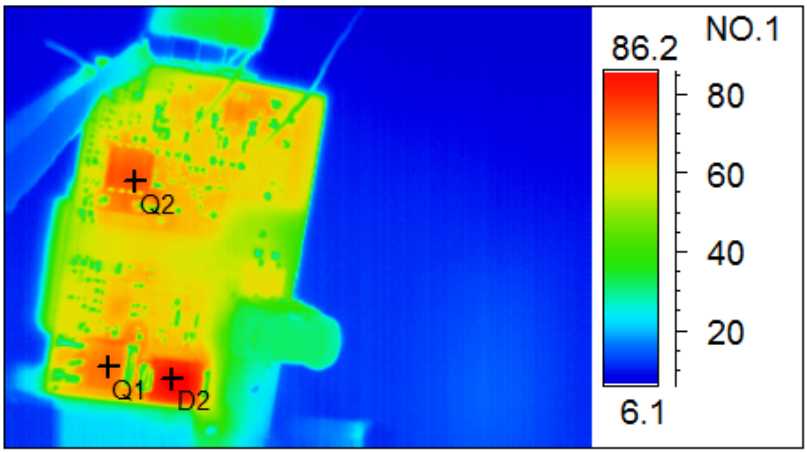
Front



Spot analysis	Value
R2 Temperature	97.1°C
T1 Temperature	75.2°C
D3 Temperature	81.4°C

NO.1

Back

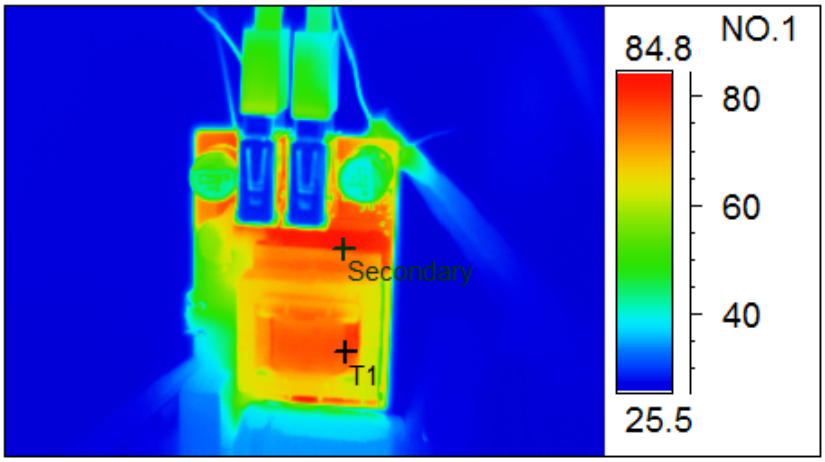


Spot analysis	Value
Q2Temperature	78.2°C
Q1 Temperature	75.0°C
D2Temperature	87.5°C

NO.1

5.2 230VAC/50Hz

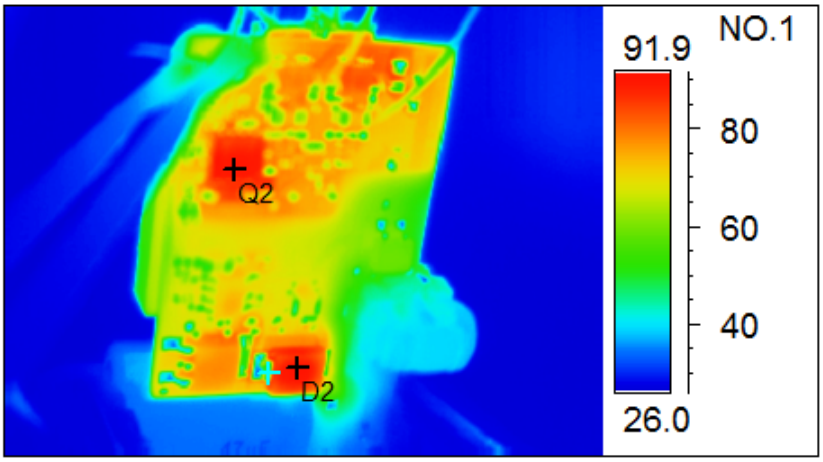
Front



NO.1

Spot analysis	Value
T1 Temperature	80.1°C
Secondary Temperature	86.3°C

Back

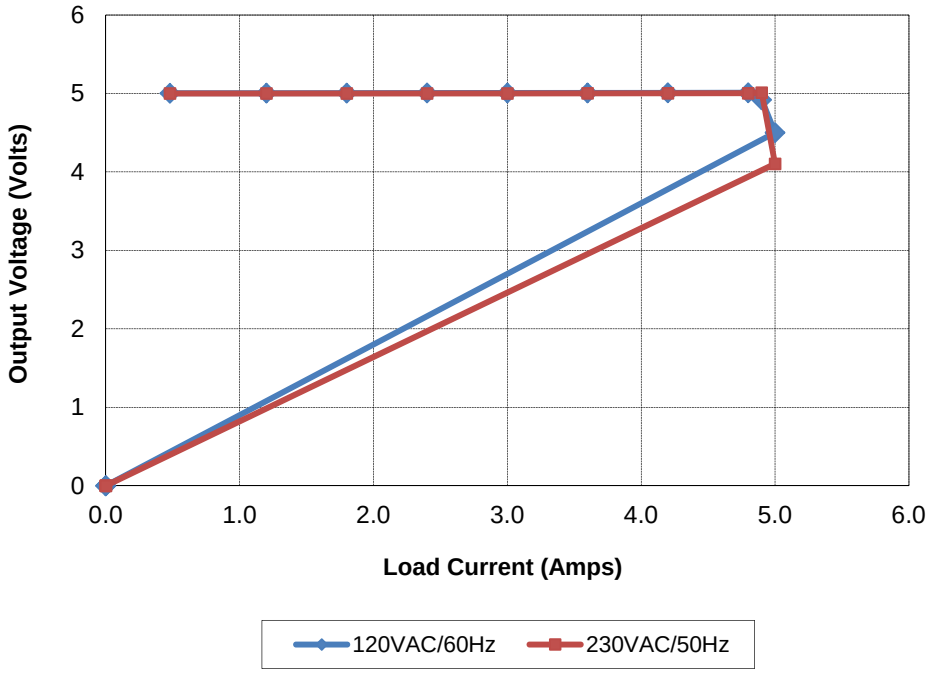


NO.1

Spot analysis	Value
Q2Temperature	90.5°C
D2 Temperature	91.1°C
Temperature	68.0°C

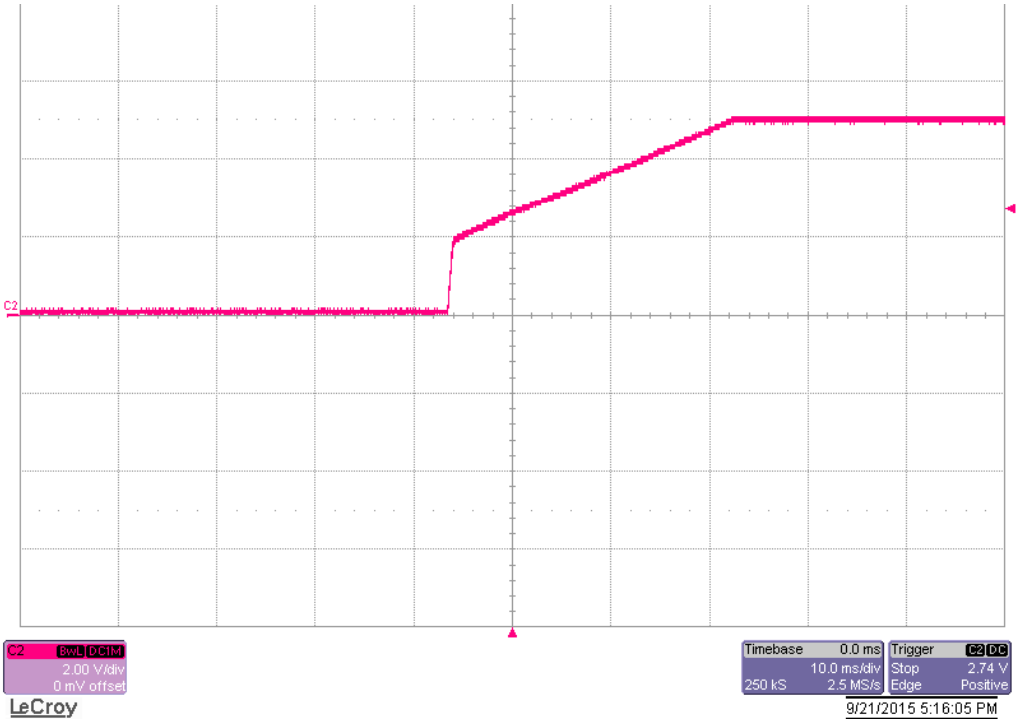
6 Current Limit

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

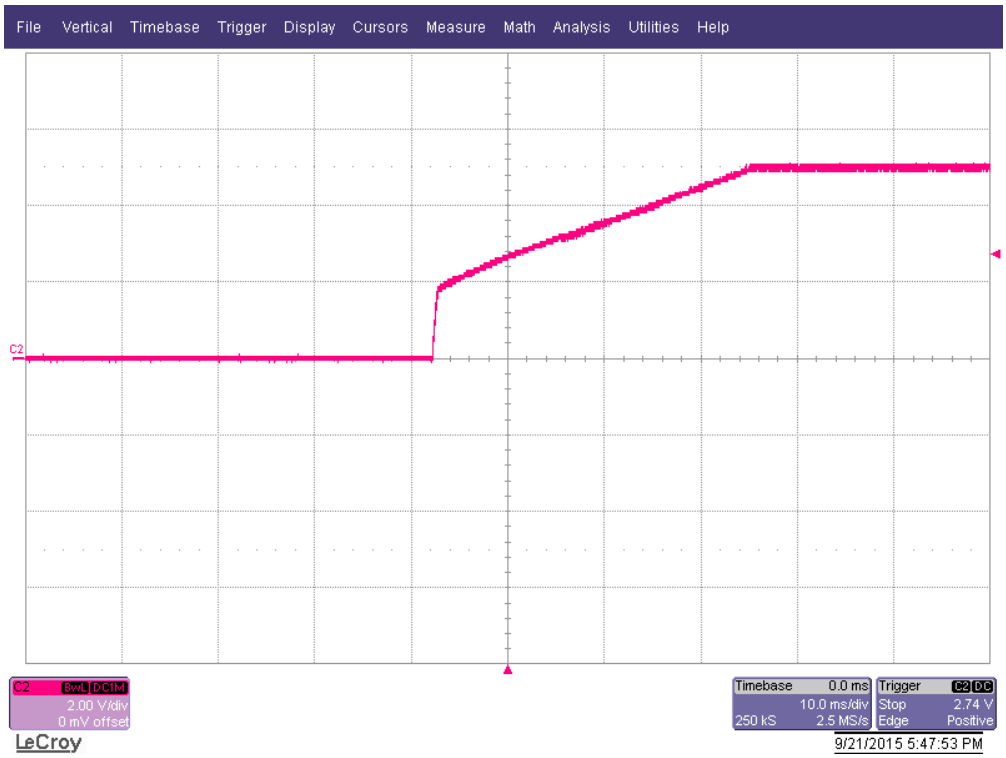


7 Startup

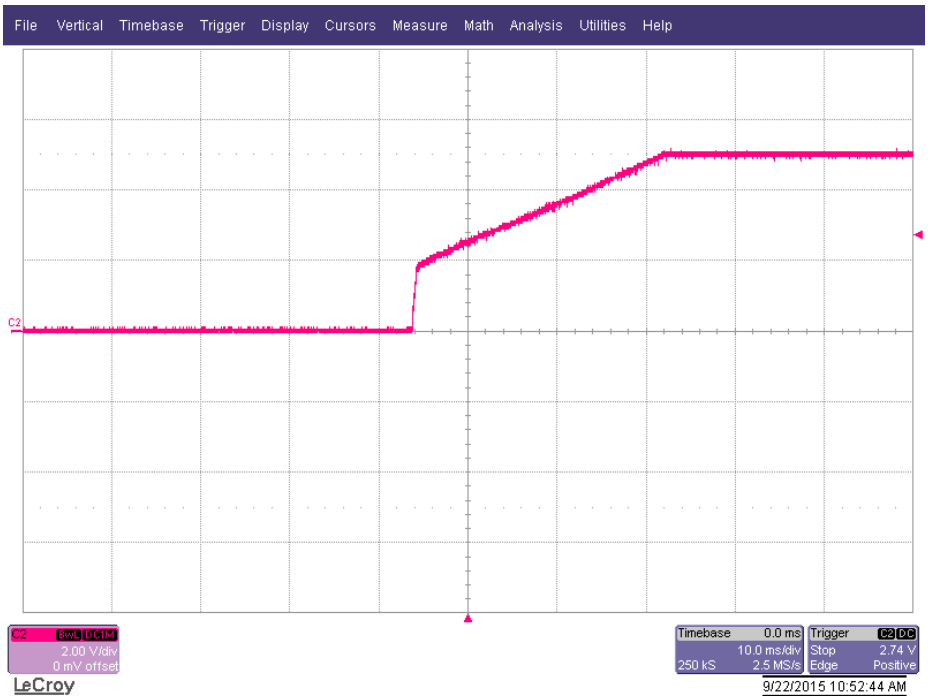
7.1 120VAC/60Hz – No load



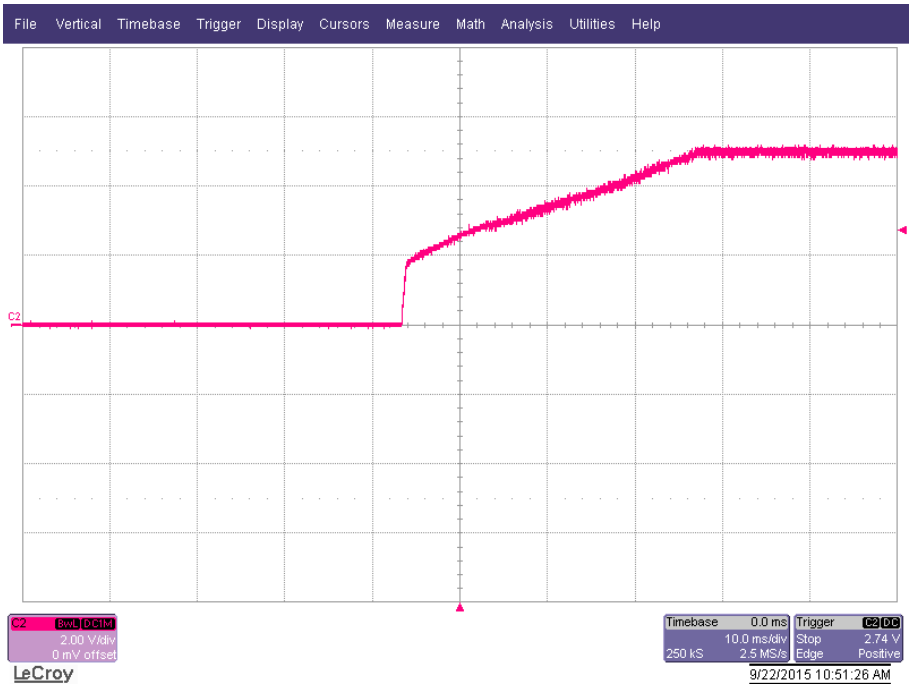
7.2 120VAC/60Hz – 1Ω Load



7.3 230VAC/50Hz – No Load

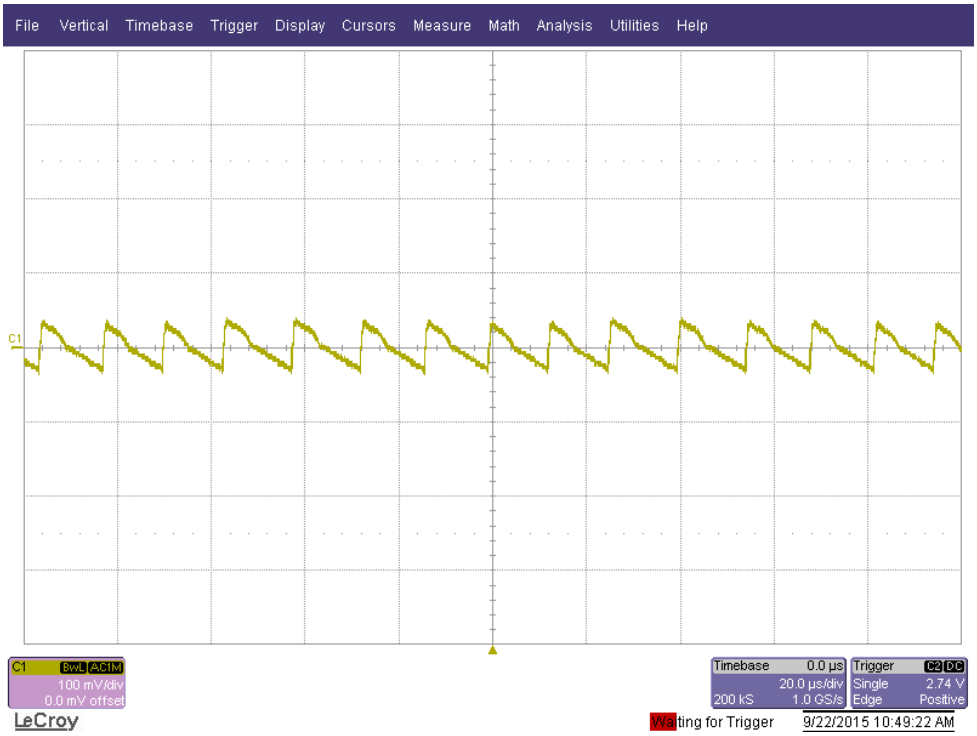


7.4 230VAC/50Hz - 1Ω Load

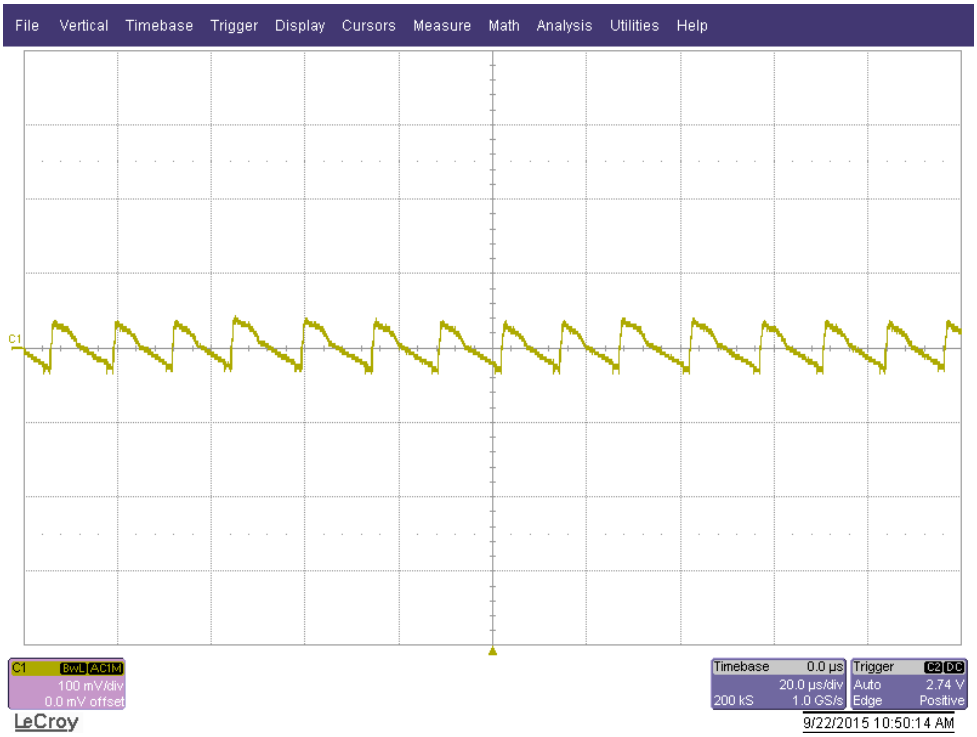


8 Output Ripple Voltage

8.1 120VAC/60Hz – Measured at J1 – 4.8A Load

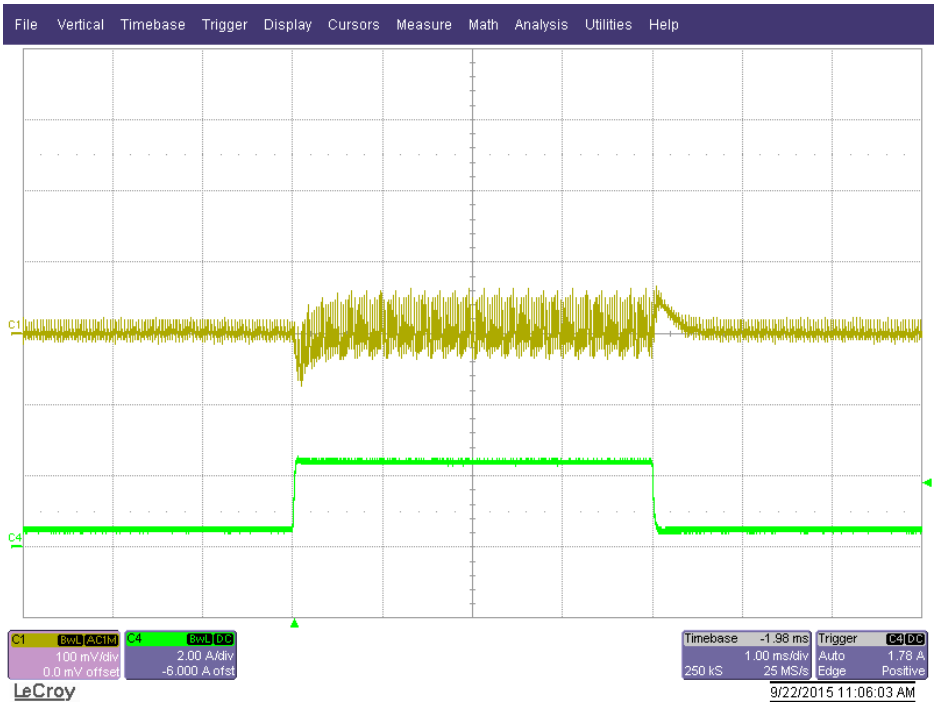


8.2 230VAC/50Hz – Measured at J1 – 4.8A Load

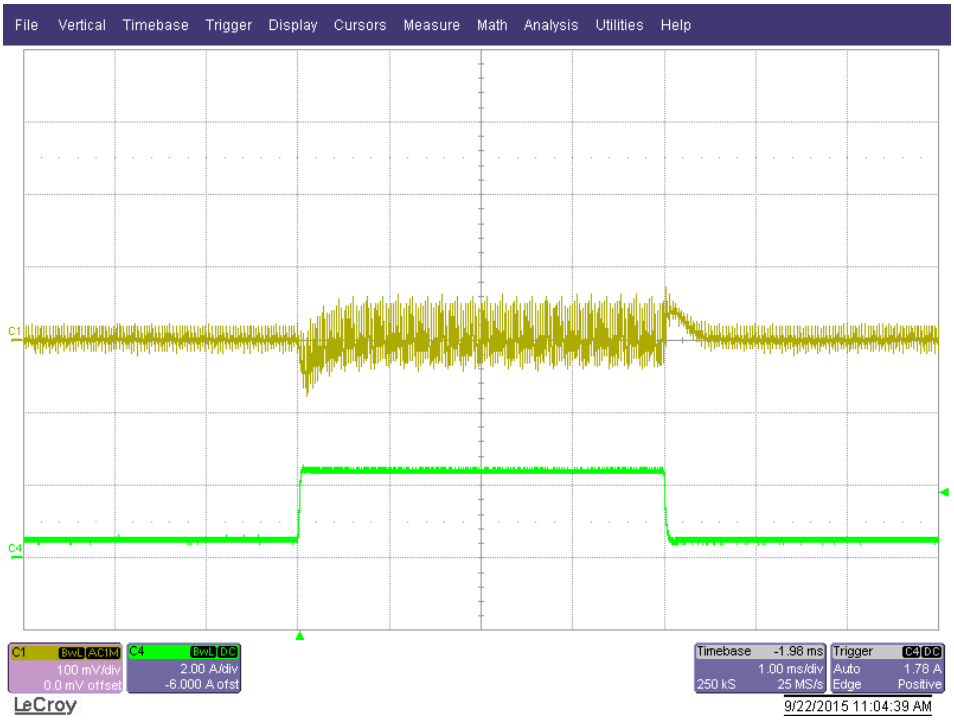


9 Load Transients

9.1 500mA to 2.4A; Transient 120VAC/60Hz Input



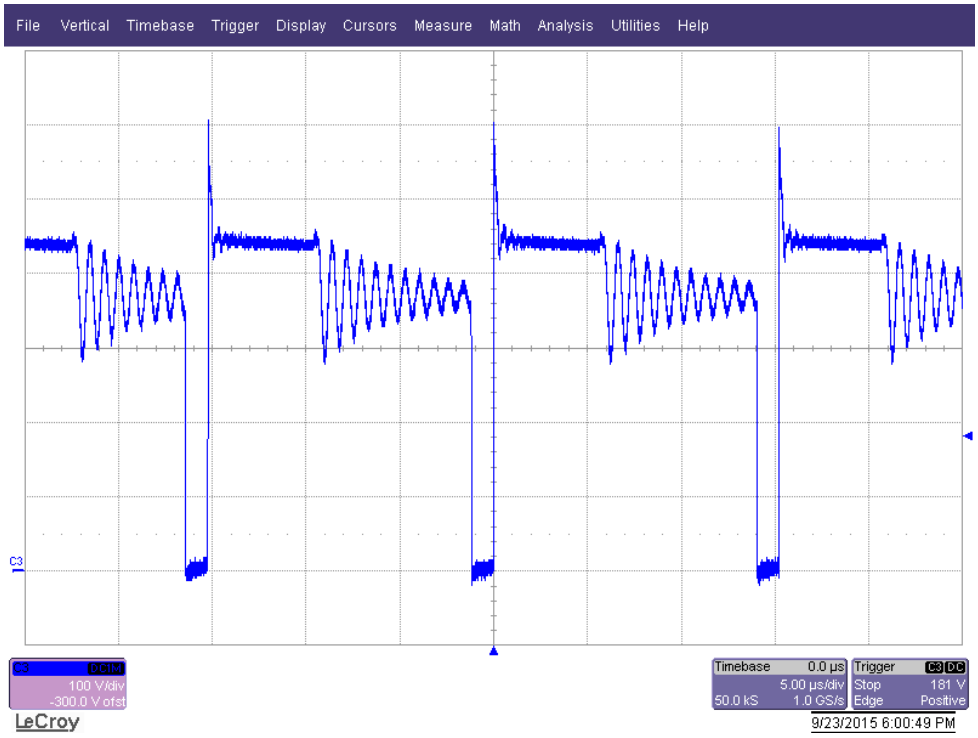
9.2 500mA to 2.4A Transient; 230VAC/50Hz Input



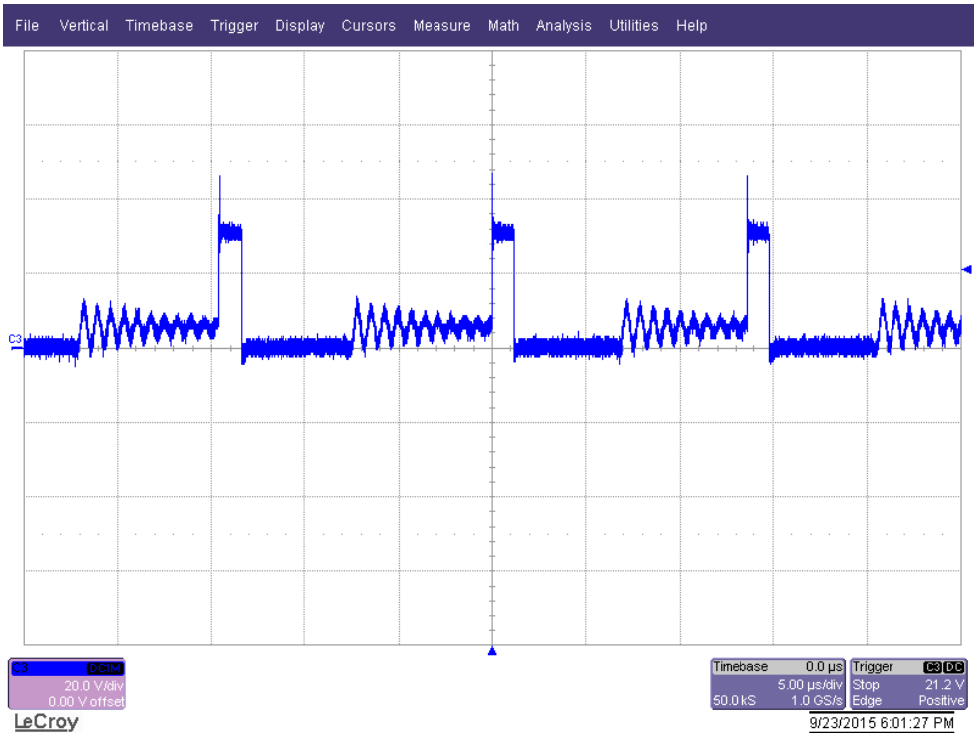
10 Switching Waveforms

The input was 265VAC/50Hz, and the output was loaded with 4.8A.

10.1 Drain of Primary FET – Q1

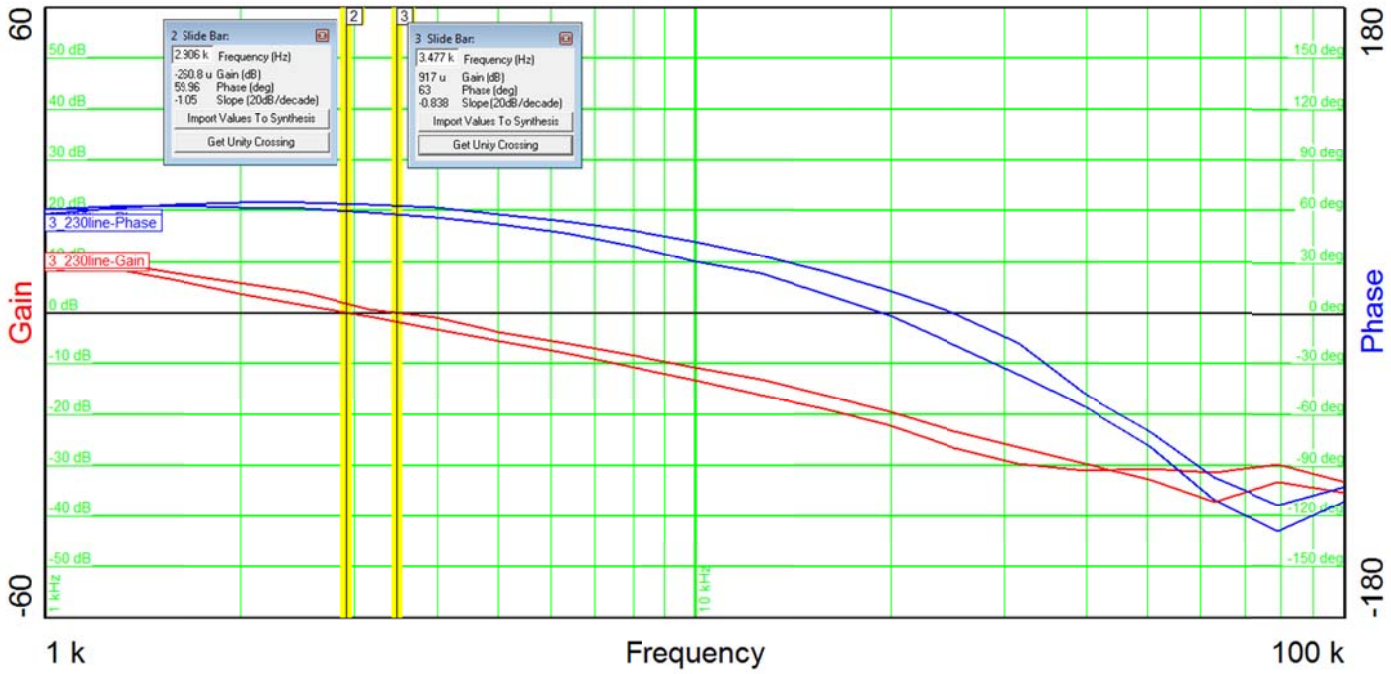


10.2 Drain of Secondary FET – Q2

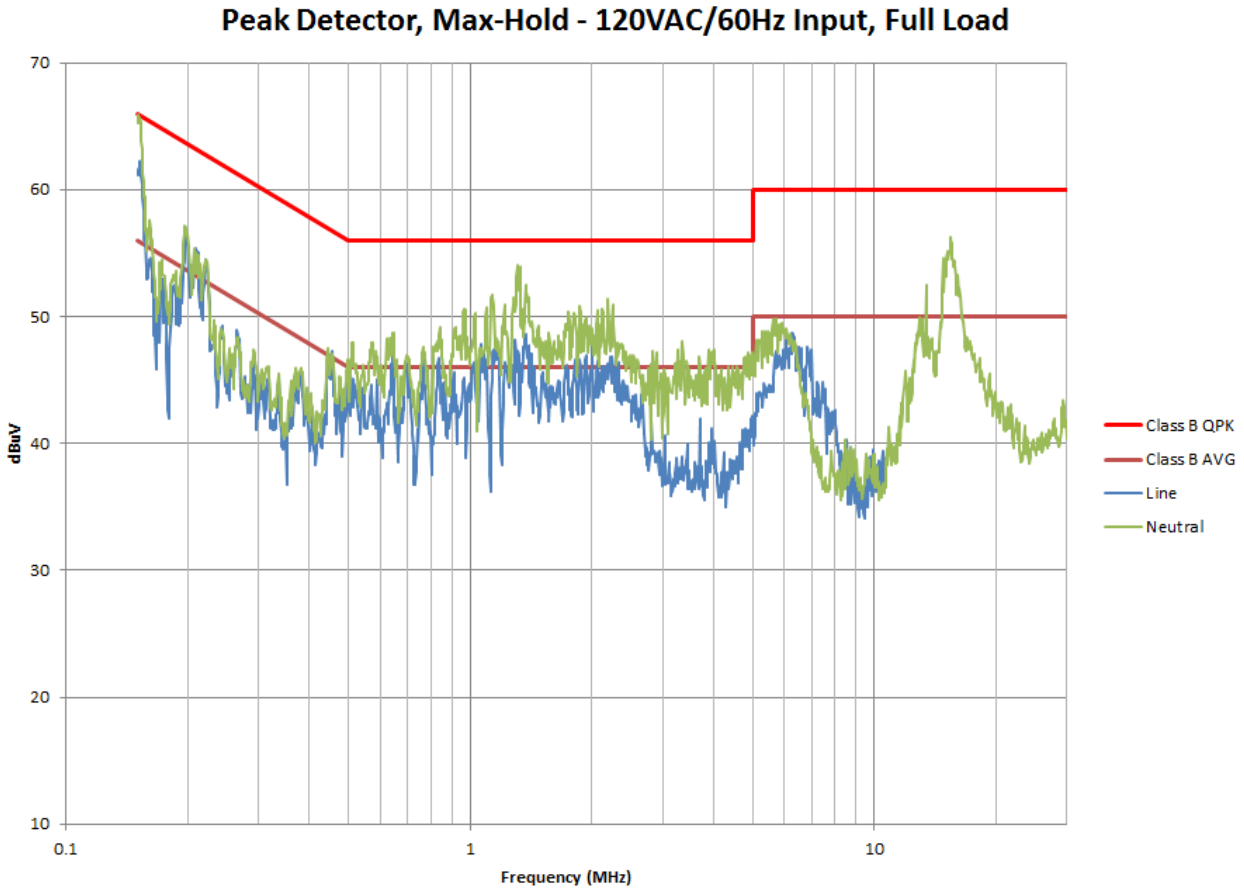


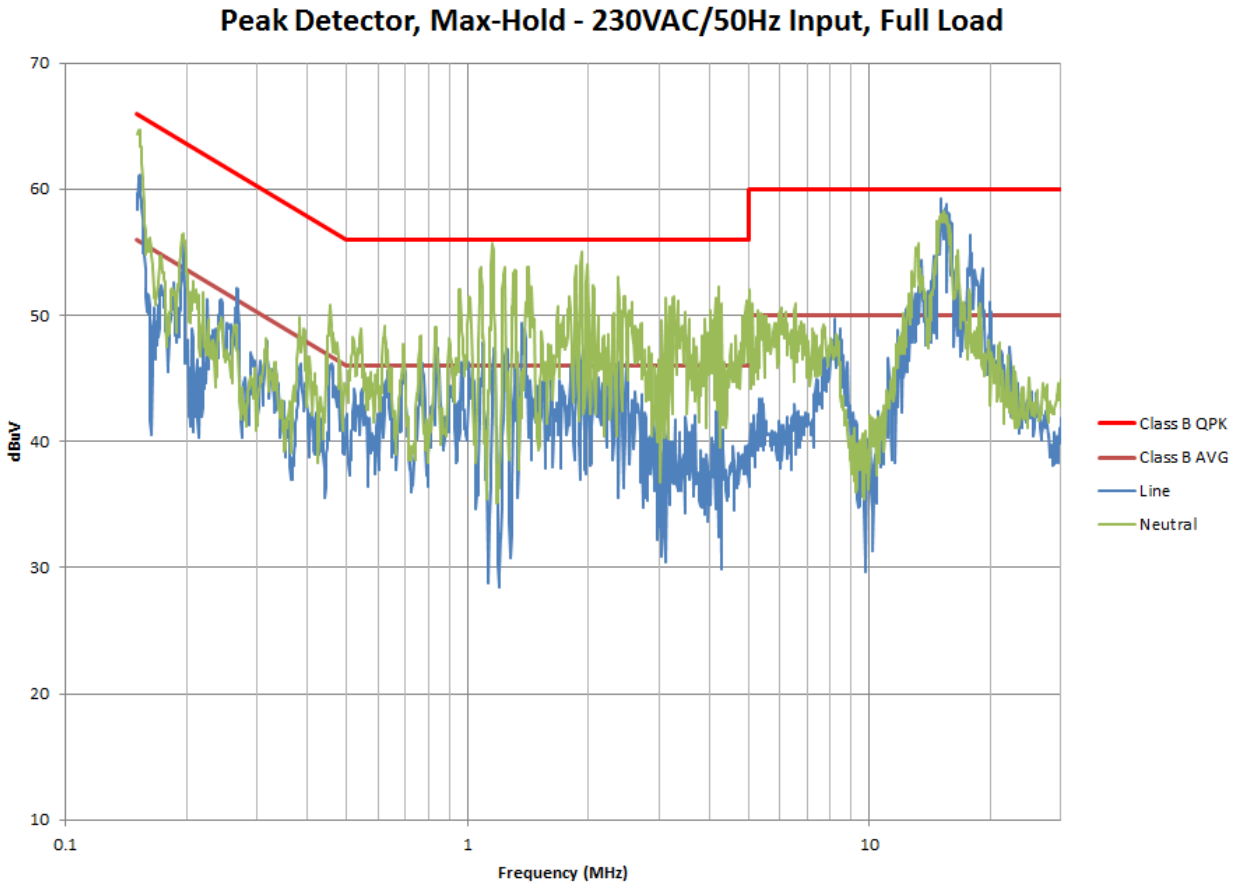
11 Loop Stability

The bode plot below shows the loops stability for both the 120VAC and 230VAC cases when fully loaded to 4.8A.



12 Conducted Emissions




Peak Detector, Max-Hold - 230VAC/50Hz Input, Full Load
70
60
50
40
30
20
10
dBuV
0.1
1
10
Frequency (MHz)
Class B QPK
Class B AVG
Line
Neutral

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265