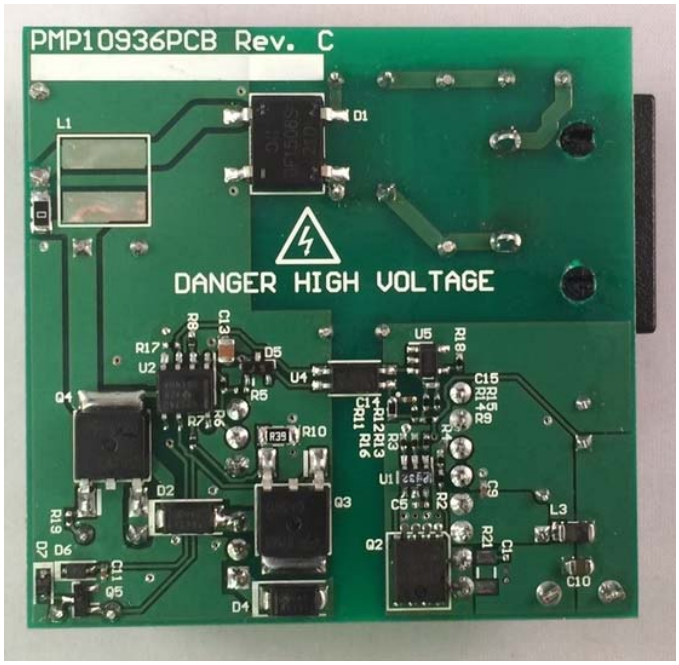
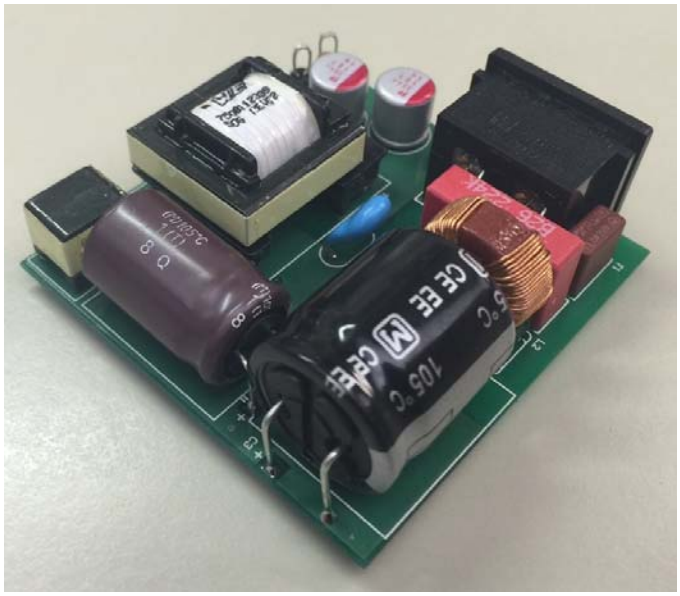
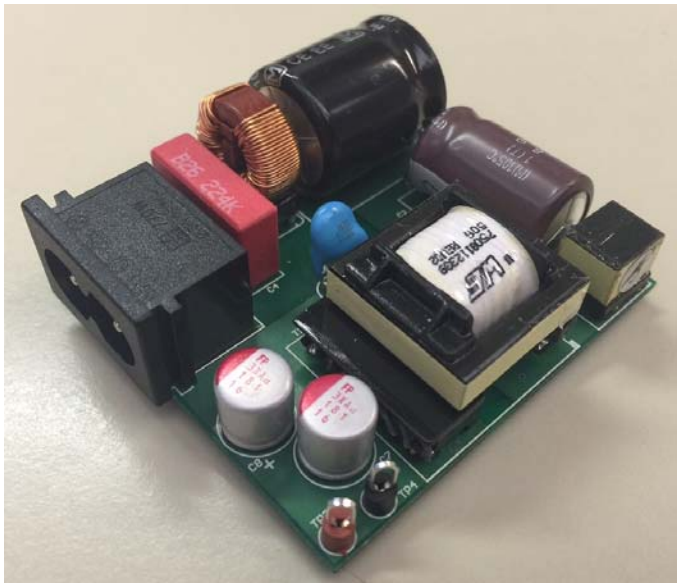
1 Photos





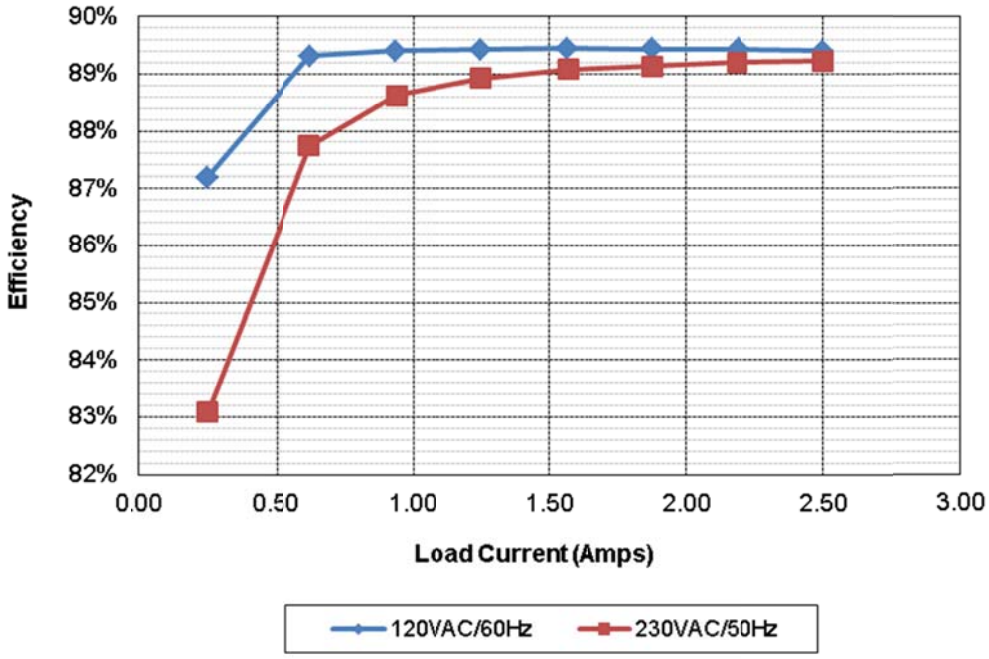


2 Standby Power

No Load	Pin AC (W)
120VAC/60Hz	0.029
230VAC/50Hz	0.034

3 Efficiency

Vin	Pin	Vout	Iout	Load	Efficiency	Avg. Eff.
120VAC/60Hz	3.44	12.03	0.249	10%	87.18%	
	8.43	12.02	0.626	25%	89.31%	**89.40%**
	16.80	12.02	1.250	50%	89.43%	
	25.20	12.02	1.875	75%	89.43%	
	33.61	12.02	2.500	100%	89.41%	
230VAC/50Hz	3.62	12.03	0.250	10%	83.08%	
	8.56	12.02	0.625	25%	87.73%	**88.75%**
	16.90	12.02	1.250	50%	88.92%	
	25.31	12.02	1.877	75%	89.14%	
	33.68	12.02	2.500	100%	89.22%	

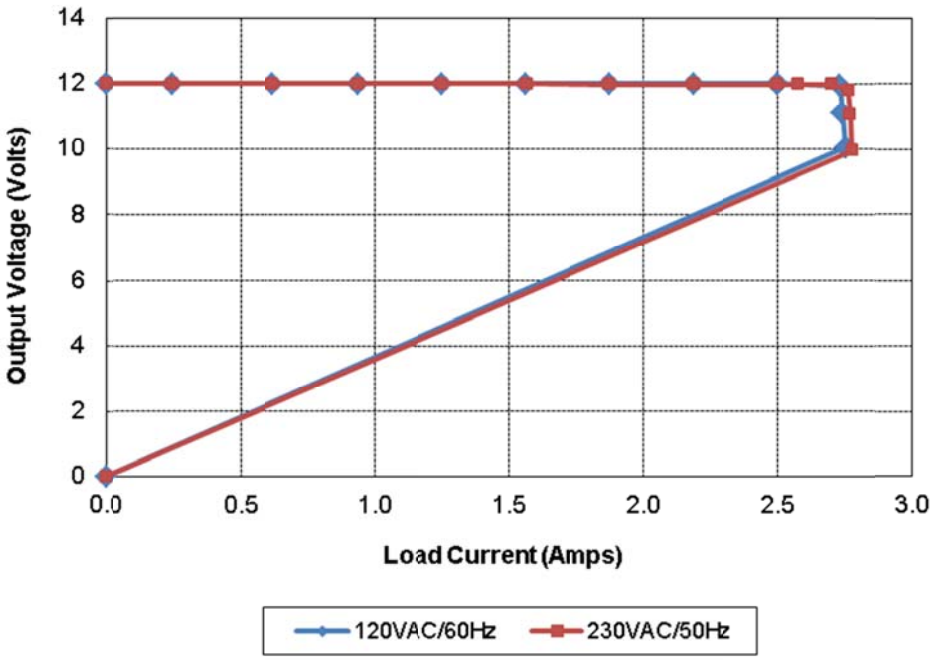


120VAC/60Hz

Iout	Vout	Vin	Iin	Pin	PF	Pout	Losses	Efficiency
0.000	12.02	120.0	0.01050	0.0291		0.00	0.03	
0.249	12.03	119.9	0.0917	3.436	0.312	3.00	0.44	87.2%
0.626	12.02	119.9	0.2036	8.425	0.345	7.52	0.90	89.3%
0.936	12.02	119.9	0.2818	12.584	0.372	11.25	1.33	89.4%
1.250	12.02	119.9	0.3489	16.801	0.402	15.03	1.78	89.4%
1.562	12.02	119.9	0.4119	20.99	0.425	18.78	2.21	89.4%
1.875	12.02	119.9	0.4737	25.20	0.444	22.54	2.66	89.4%
2.188	12.02	119.9	0.5344	29.40	0.459	26.29	3.11	89.4%
2.500	12.02	119.9	0.5937	33.61	0.472	30.05	3.56	89.4%

230VAC/50Hz								
Iout	Vout	Vin	Iin	Pin	PF	Pout	Losses	Efficiency
0.000	12.02	229.9	0.01612	0.0340		0.00	0.03	
0.250	12.03	229.9	0.0637	3.620	0.247	3.01	0.61	83.1%
0.625	12.02	229.9	0.1255	8.563	0.297	7.51	1.05	87.7%
0.940	12.02	229.9	0.1782	12.750	0.311	11.30	1.45	88.6%
1.250	12.02	229.9	0.2295	16.897	0.320	15.03	1.87	88.9%
1.566	12.02	229.9	0.2805	21.13	0.328	18.82	2.31	89.1%
1.877	12.02	229.9	0.3295	25.31	0.334	22.56	2.75	89.1%
2.187	12.02	229.9	0.3767	29.47	0.340	26.29	3.18	89.2%
2.500	12.02	229.8	0.4210	33.68	0.348	30.05	3.63	89.2%

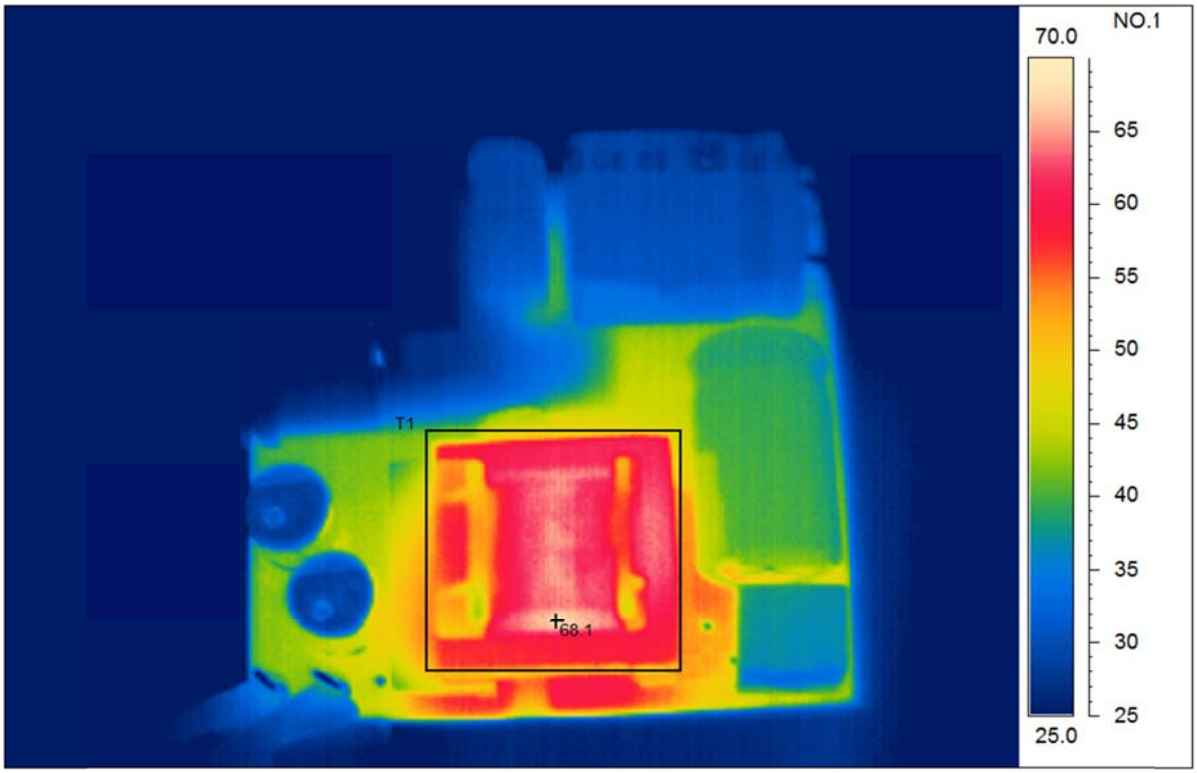
4 Current Regulation

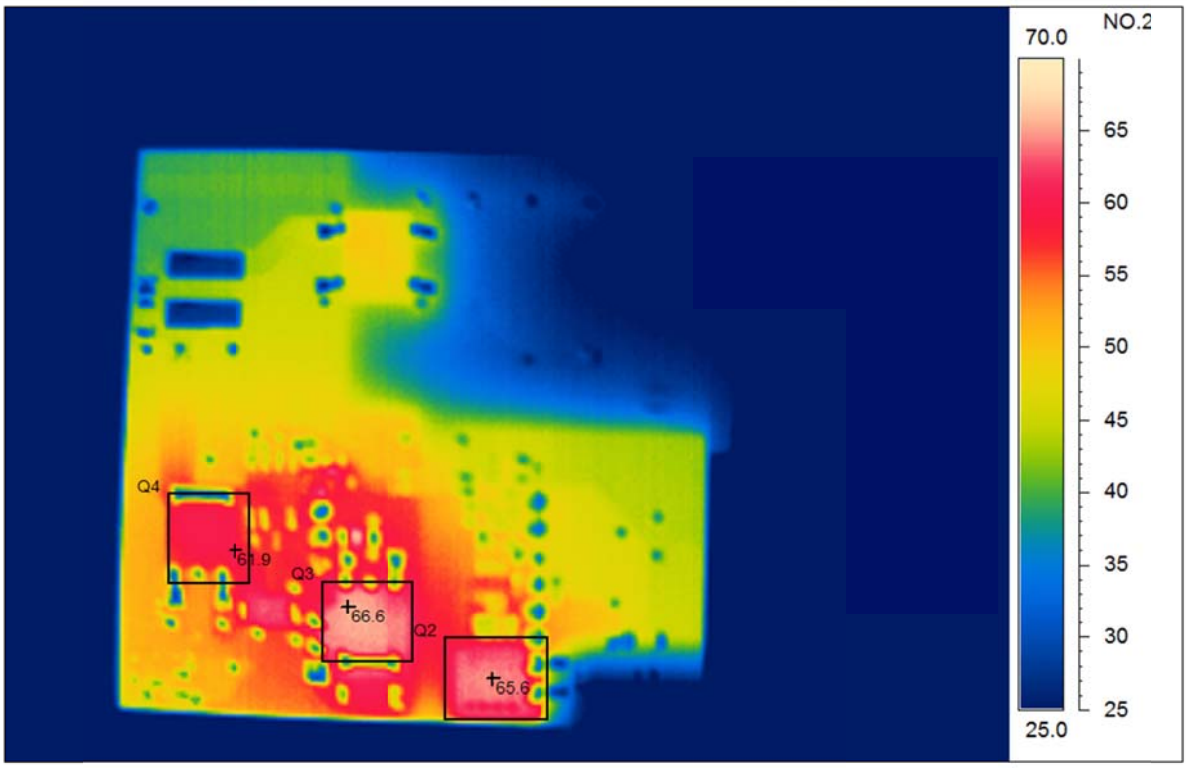


5 Thermal Images

The output was loaded with 2.5A. The ambient temperature was 25C with no forced air flow.

5.1 120VAC/60Hz Input





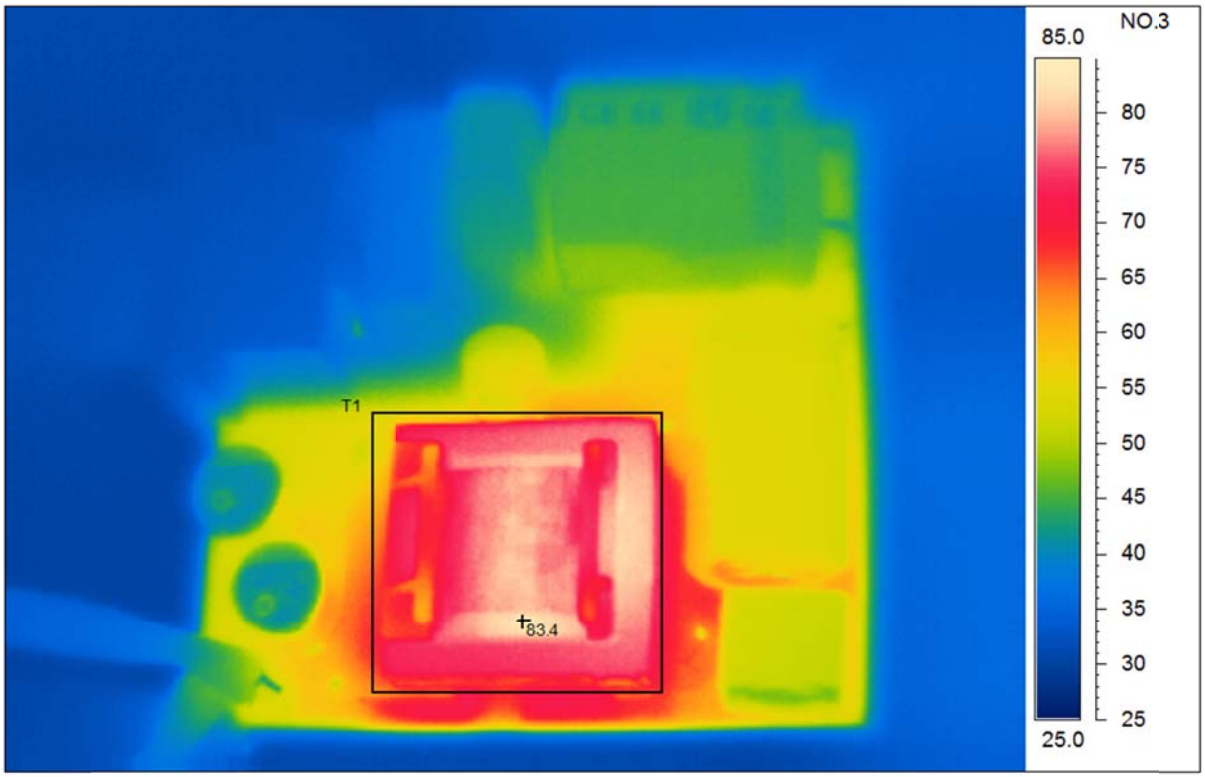
Area analysis	Value
T1 Max	68.1°C

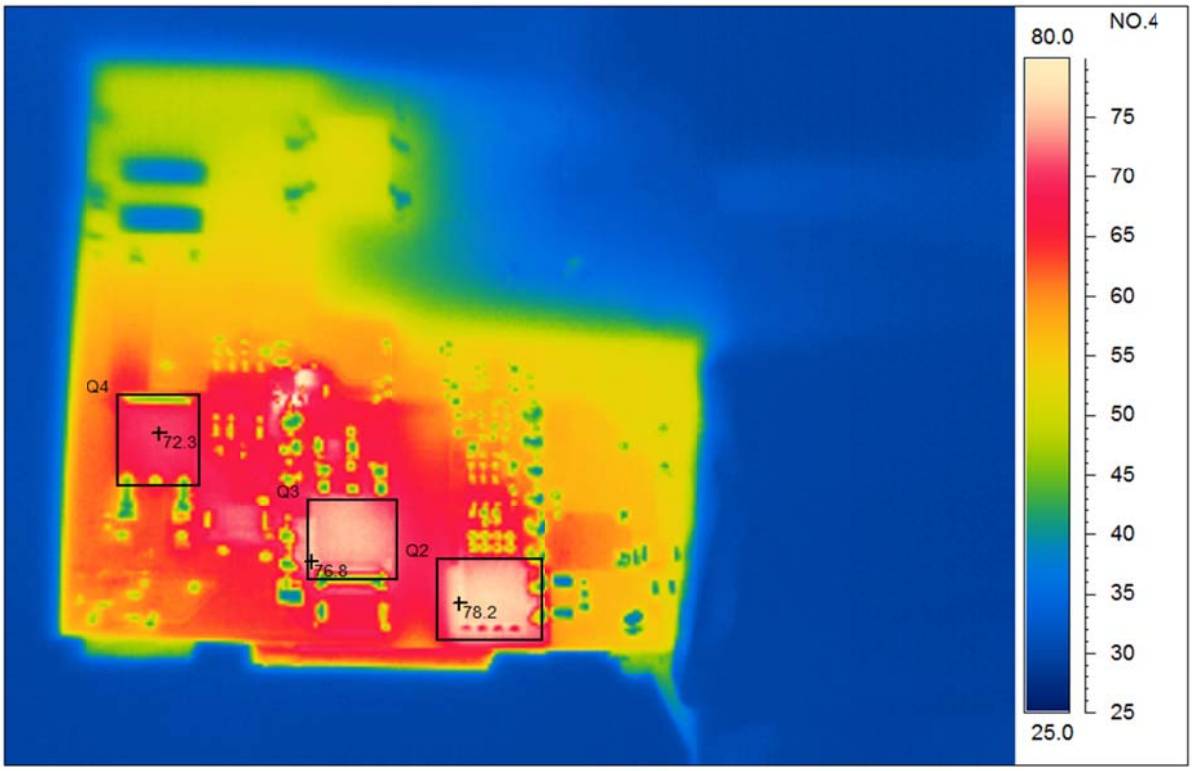
NO.1

Area analysis	Value
Q4Max	61.9°C
Q3Max	66.6°C
Q2 Max	65.6°C

NO.2

5.2 230VAC/50Hz Input





NO.3

Area analysis	Value
T1 Max	83.4°C

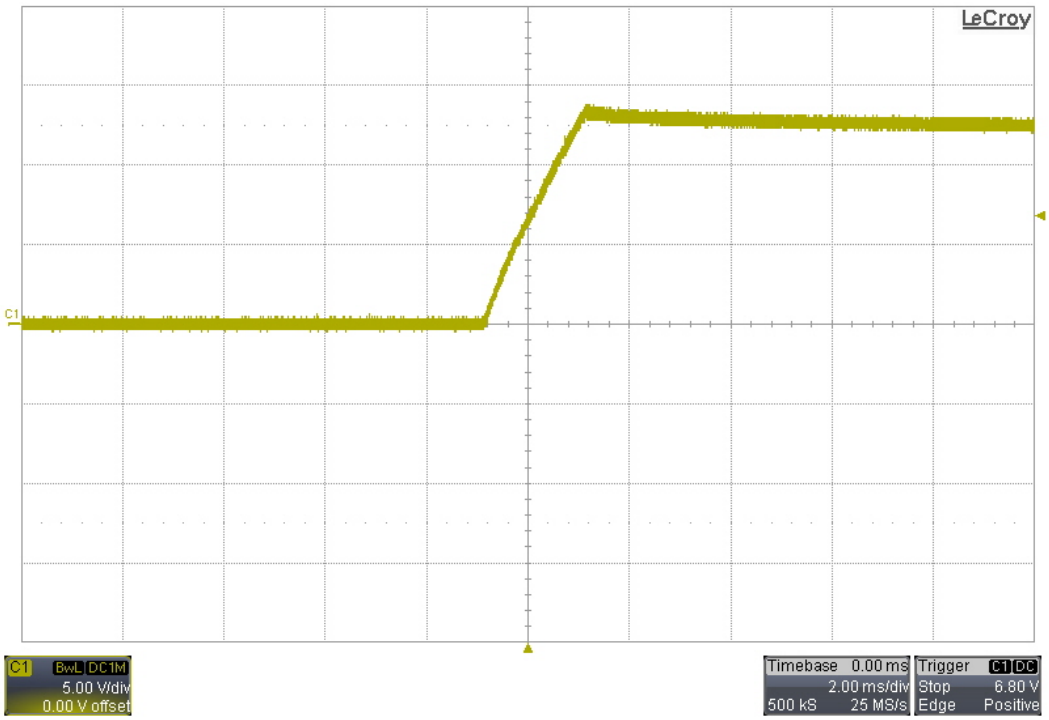
NO.4

Area analysis	Value
Q4 Max	72.3°C
Q3Max	76.8°C
Q2 Max	78.2°C

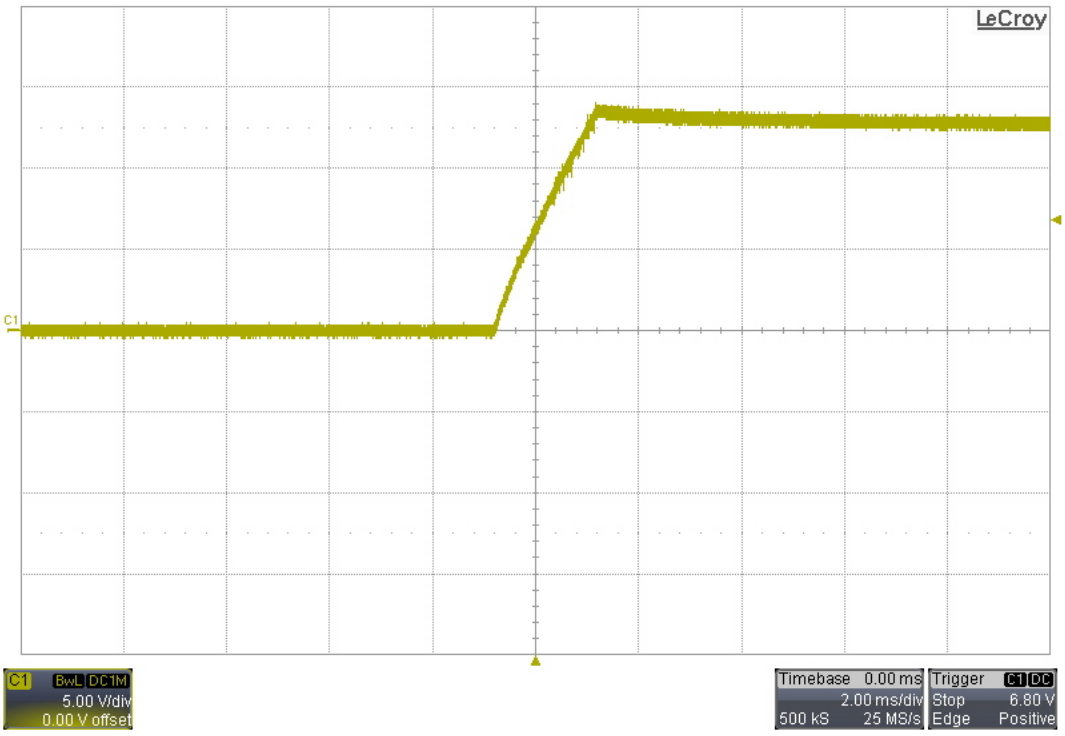
6 Startup

The following startup waveforms show the output voltage for no load, and full load.

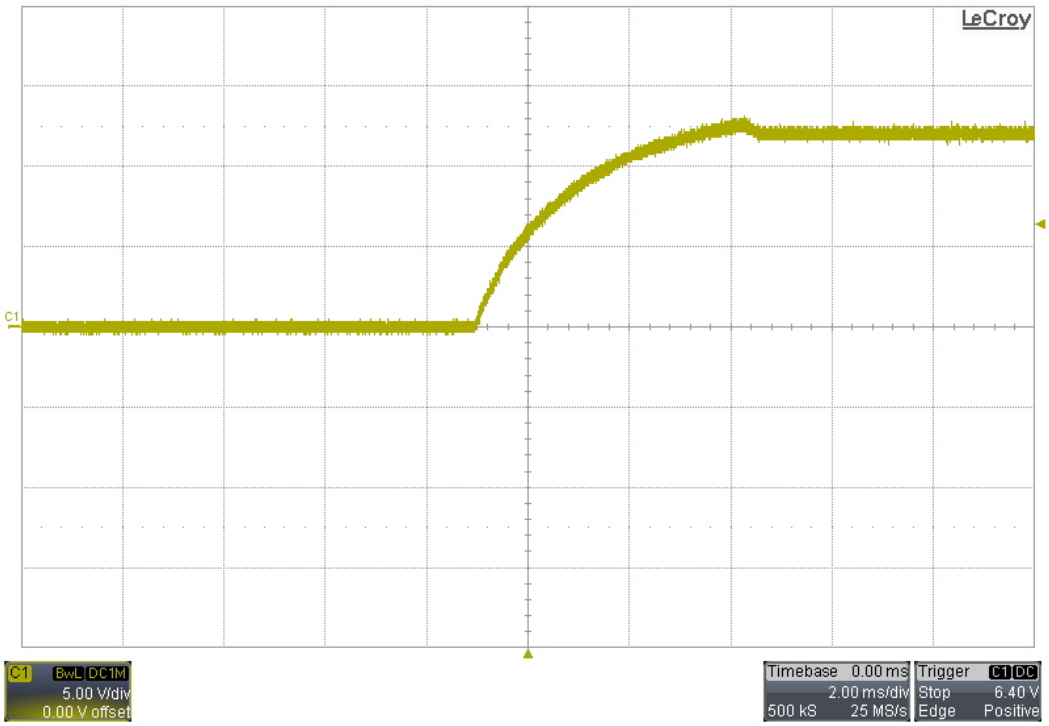
6.1 120VAC/60Hz Startup – 0A Load



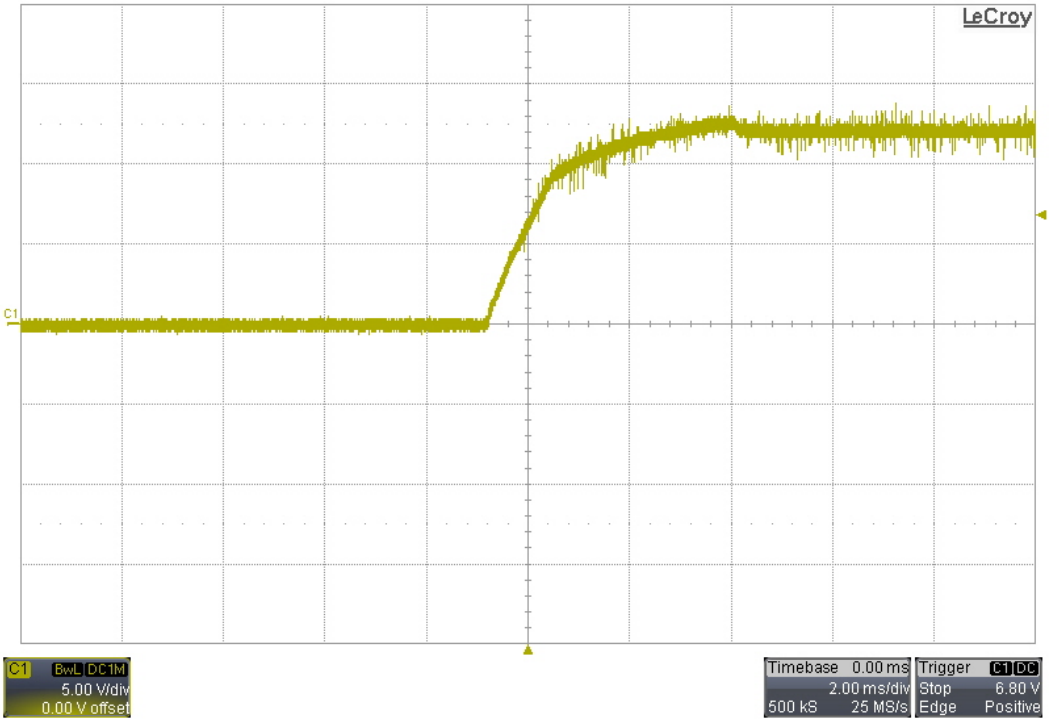
6.2 230VAC/50Hz Startup – 0A Load



6.3 120VAC/60Hz Startup – 4.8Ω Load



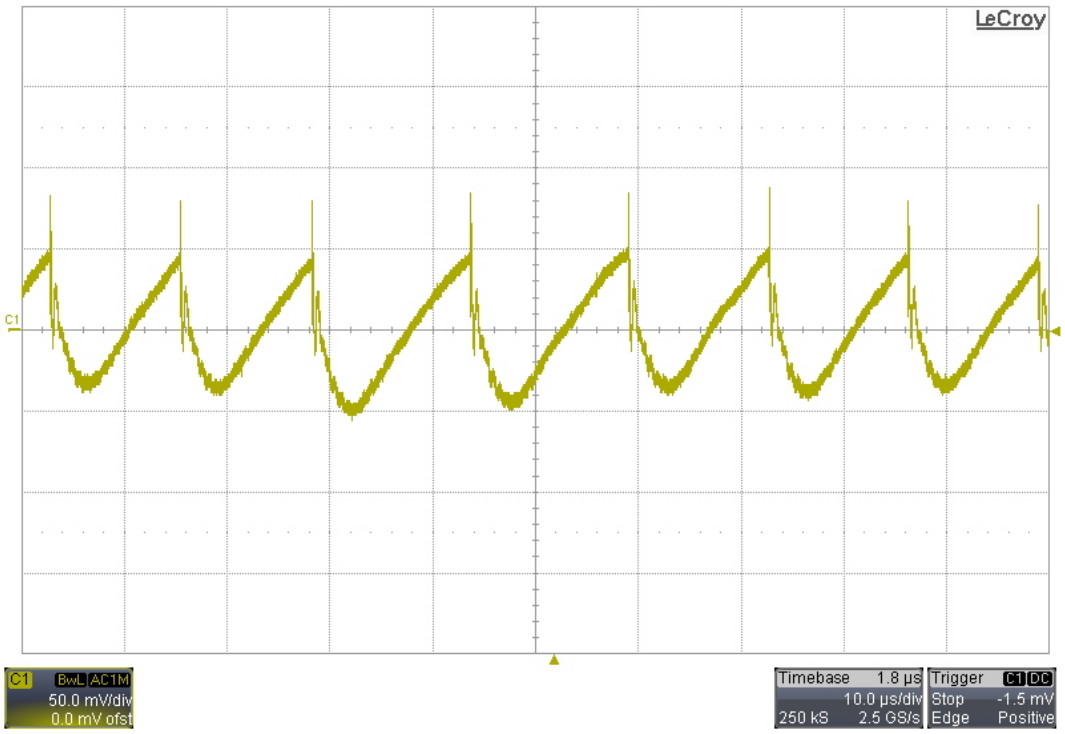
6.4 230VAC/50Hz Startup – 4.8Ω Load



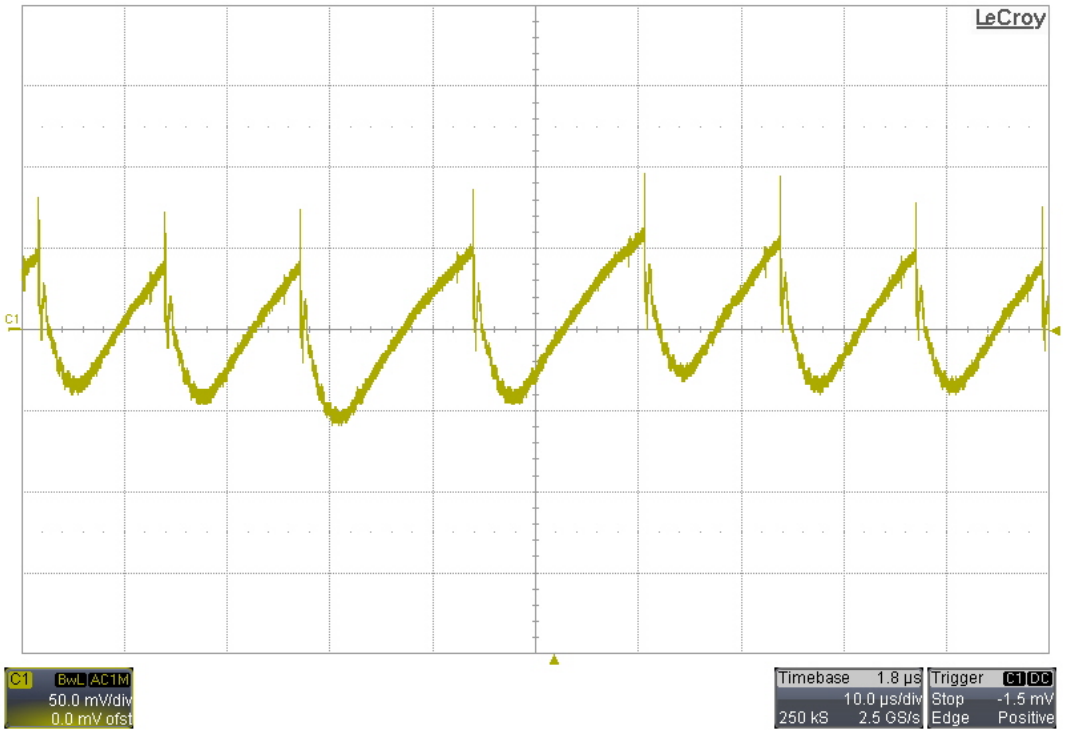
7 Output Ripple Voltage

The output was loaded with 2.5A.

7.1 120VAC/60Hz Output Ripple Voltage

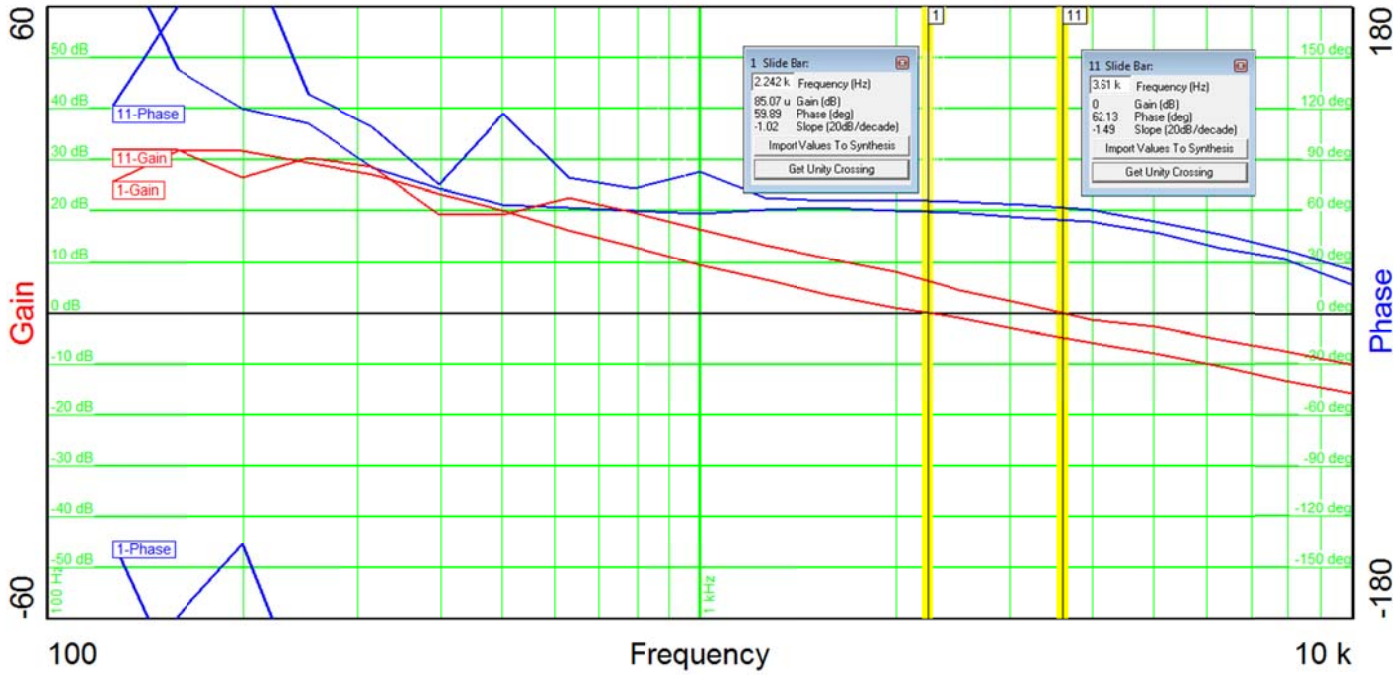


7.2 230VAC/50Hz Output Ripple Voltage



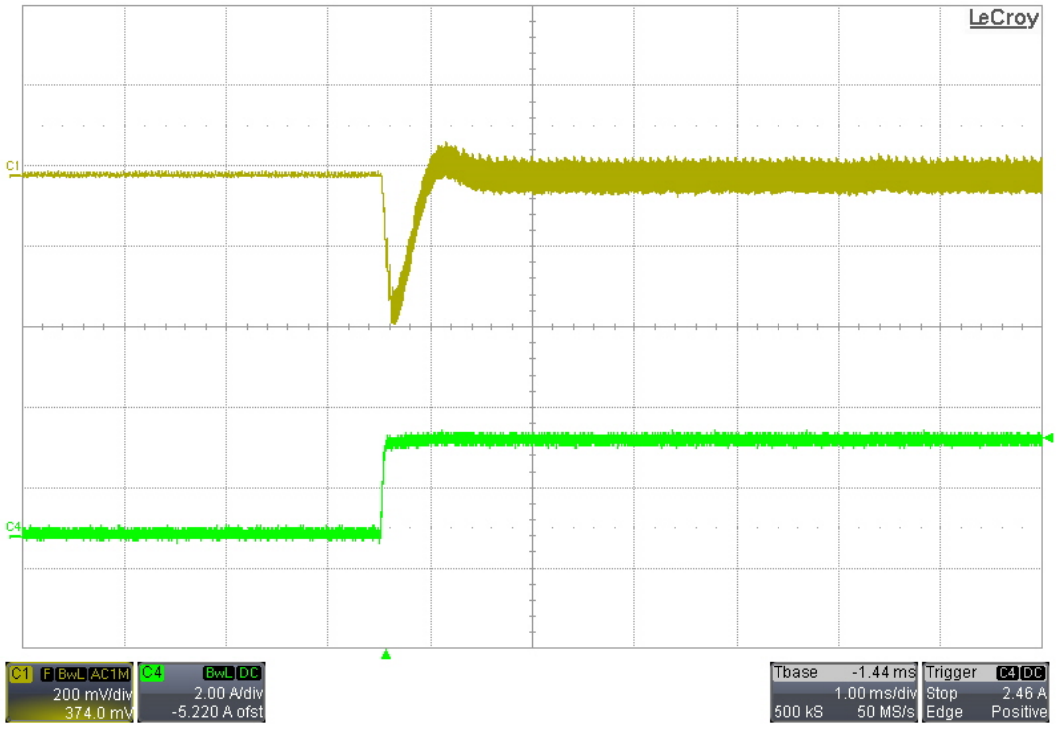
8 Frequency Response

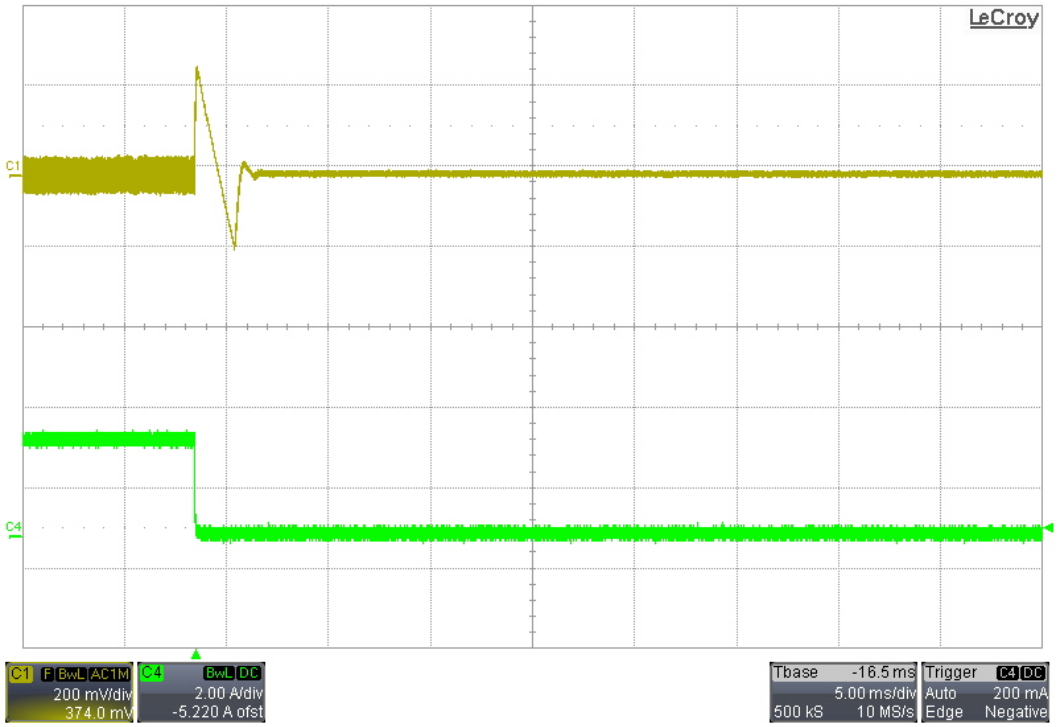
The frequency response of the feedback loop measured at R9 is shown below. For the gain/phase plot #1, the input was set to 115VAC/60Hz. For the gain/phase plot #2, the input was set to 230VAC/50Hz. The output was loaded with 2.5A.



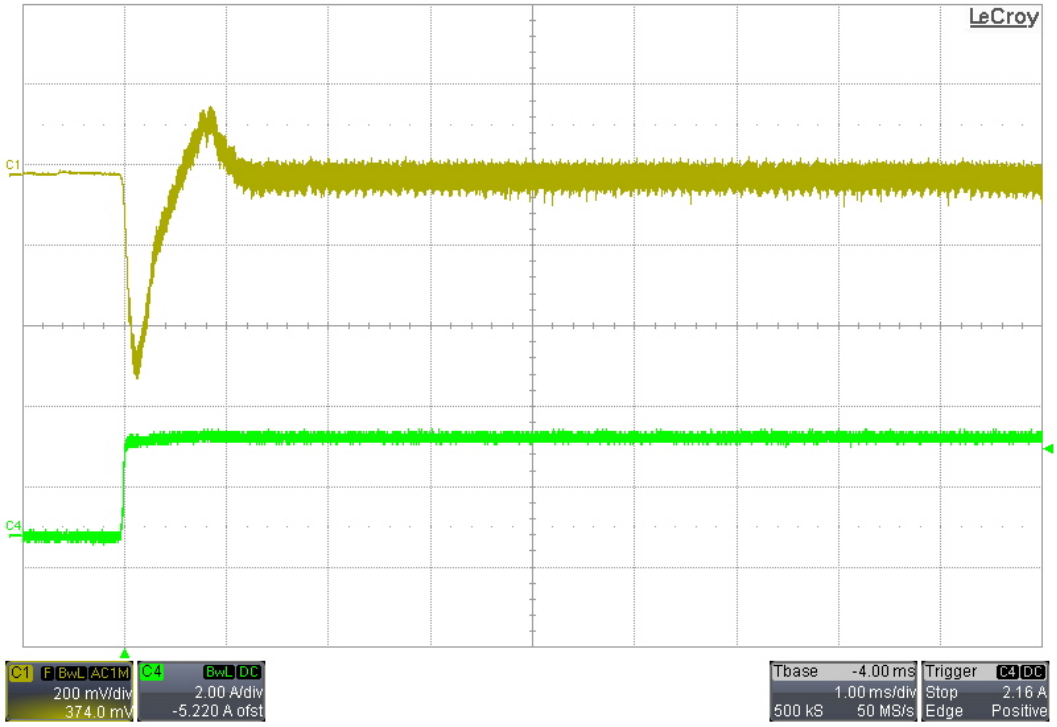
9 Load Transients

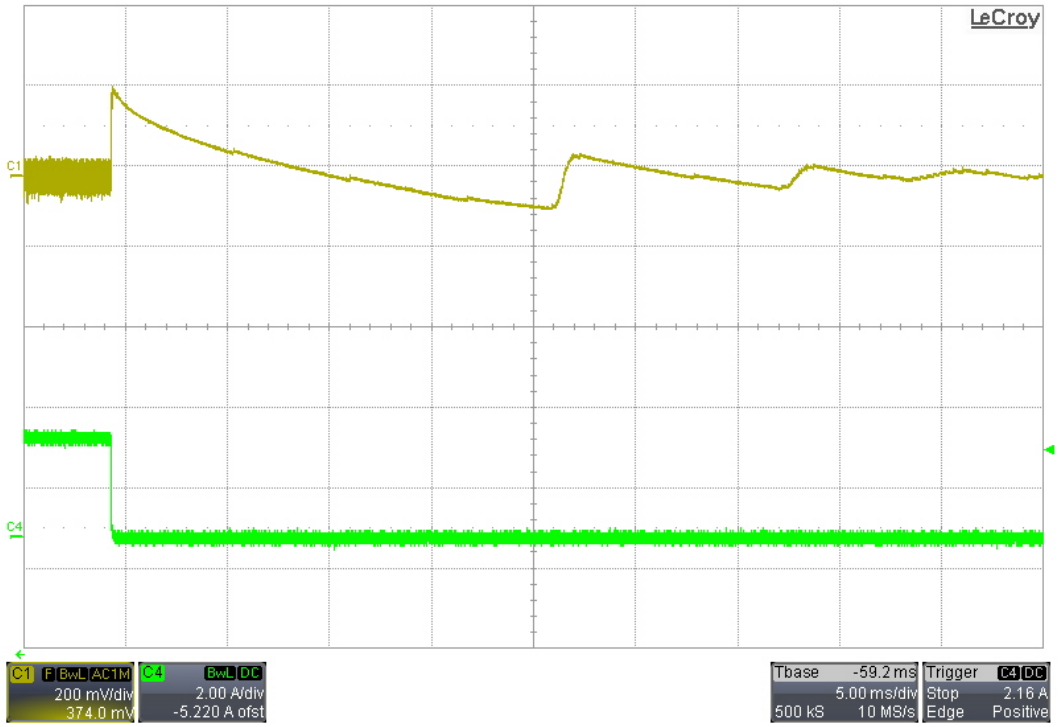
9.1 0A to 2.5A Transient – 120VAC/60Hz Input





9.2 0A to 2.5A Transient – 230VAC/50Hz Input



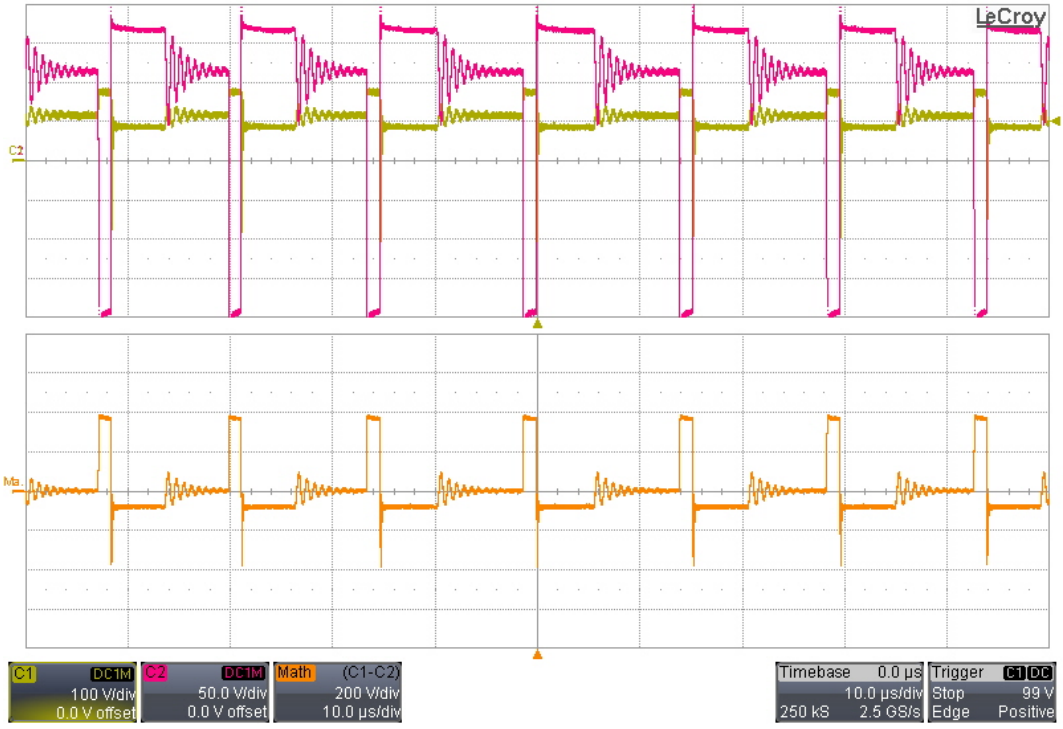


10 Switching Waveforms

The images below show the voltage waveforms on the switching devices within the supply. The input was 265VAC/50Hz. The output was loaded 2.5A.

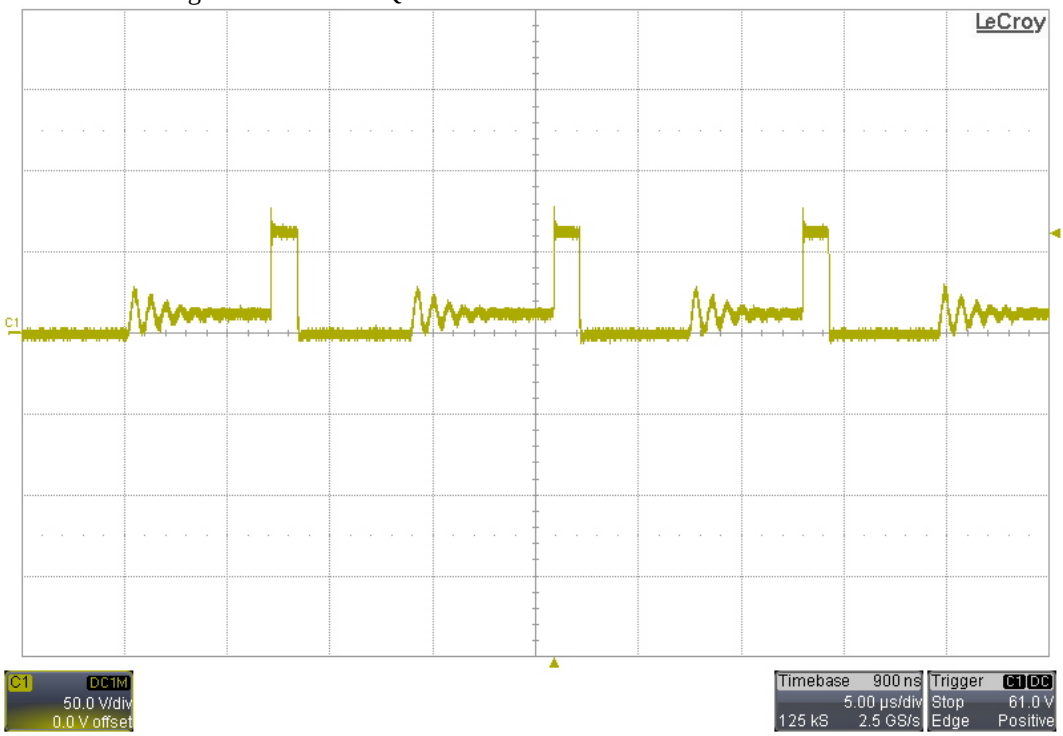
10.1 Primary Waveforms

The image below shows the Q3 (CH2), Q4 (CH1) drain voltages, and the difference between them.

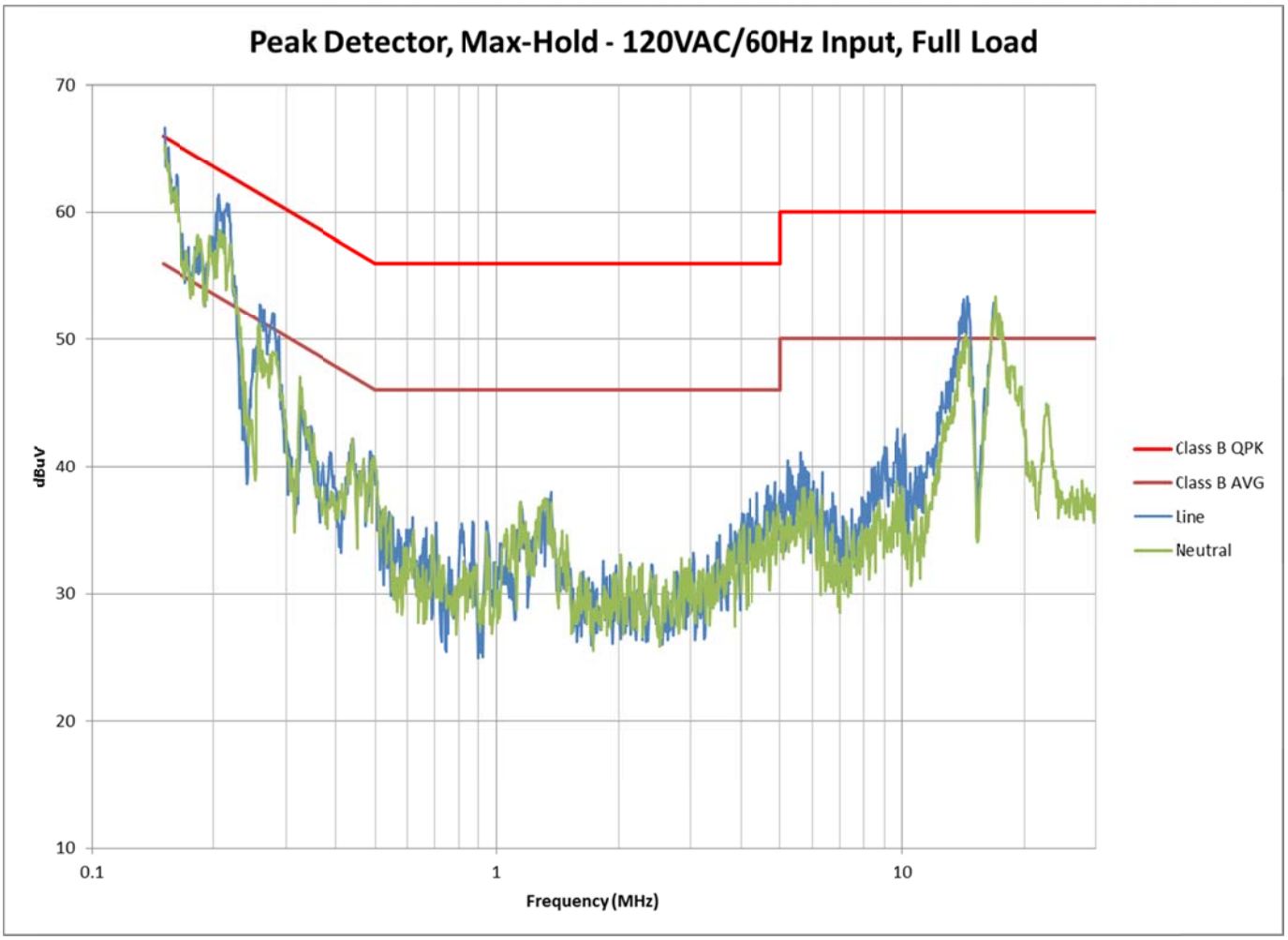


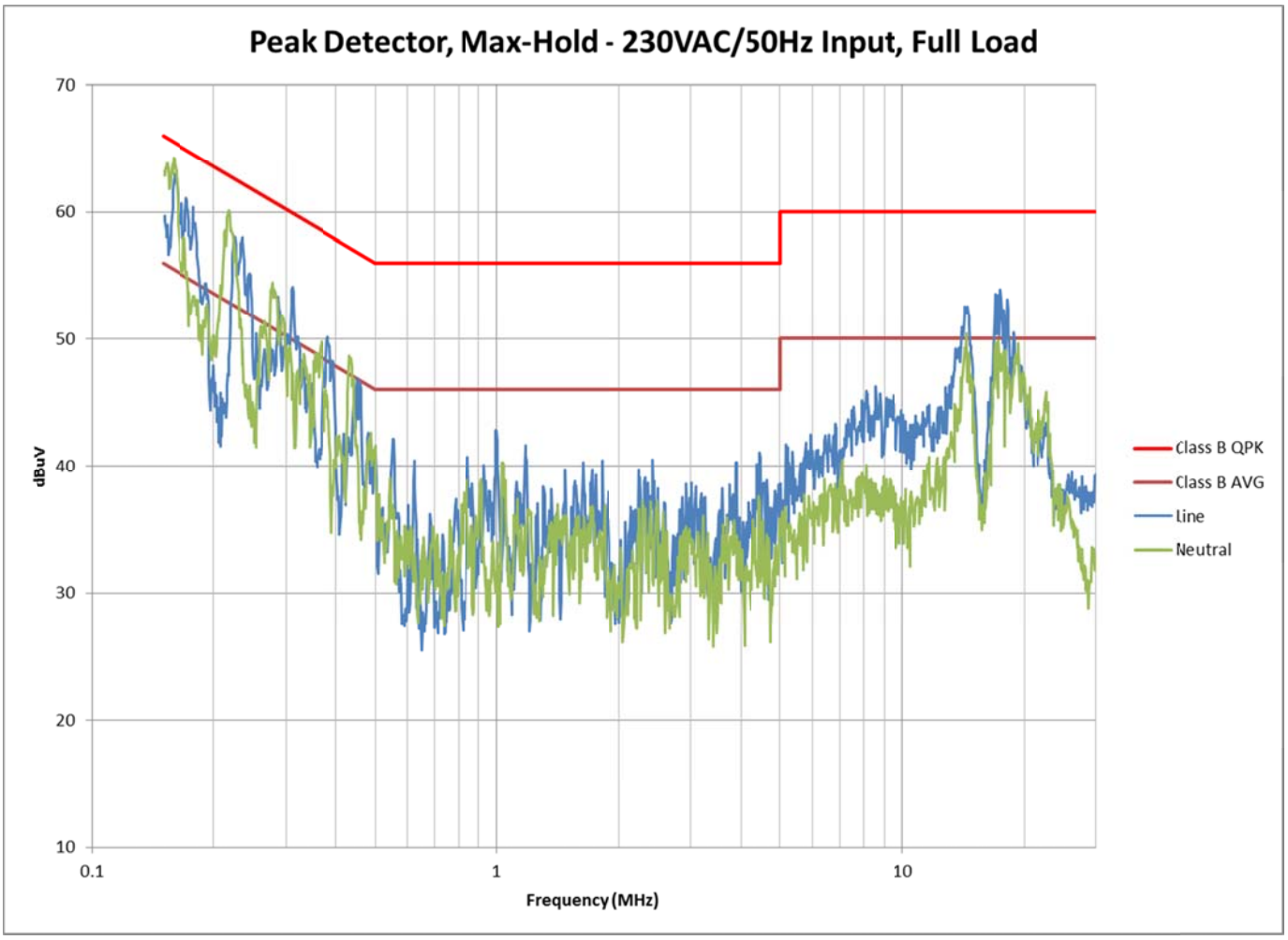
10.2 Secondary Waveforms

The image below shows the voltage on the drain of Q2.



11 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

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale (https:www.ti.com/legal/termsofsale.html) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.

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