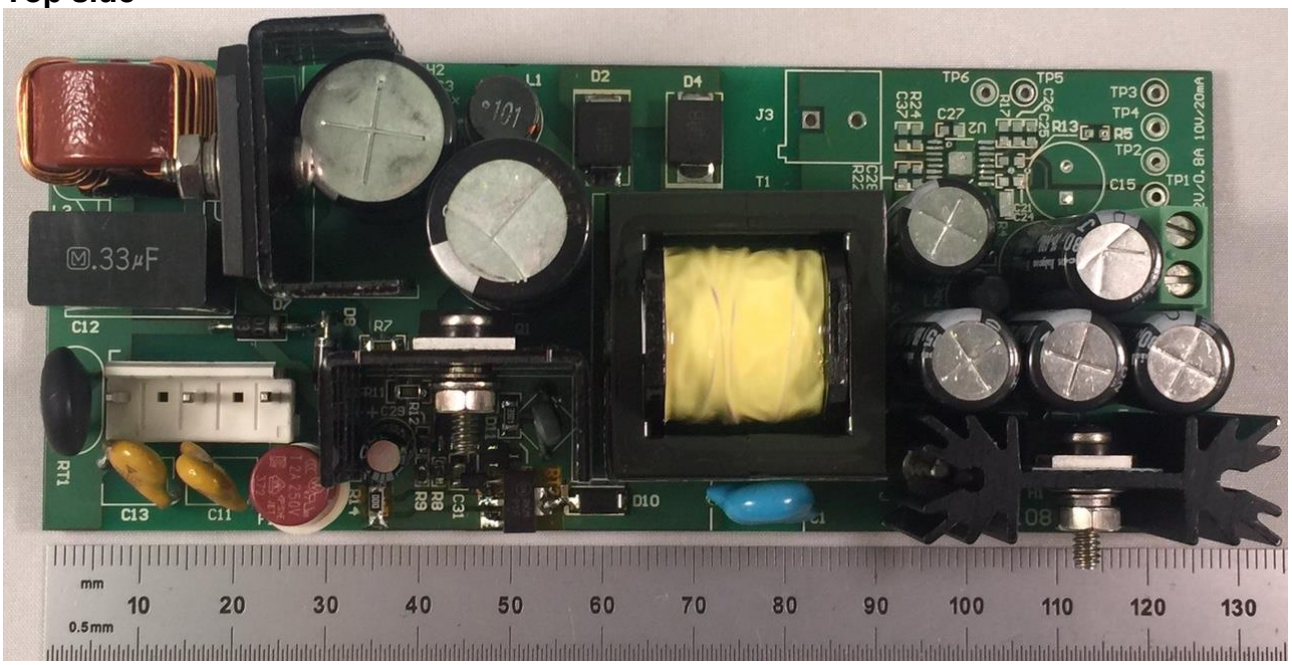
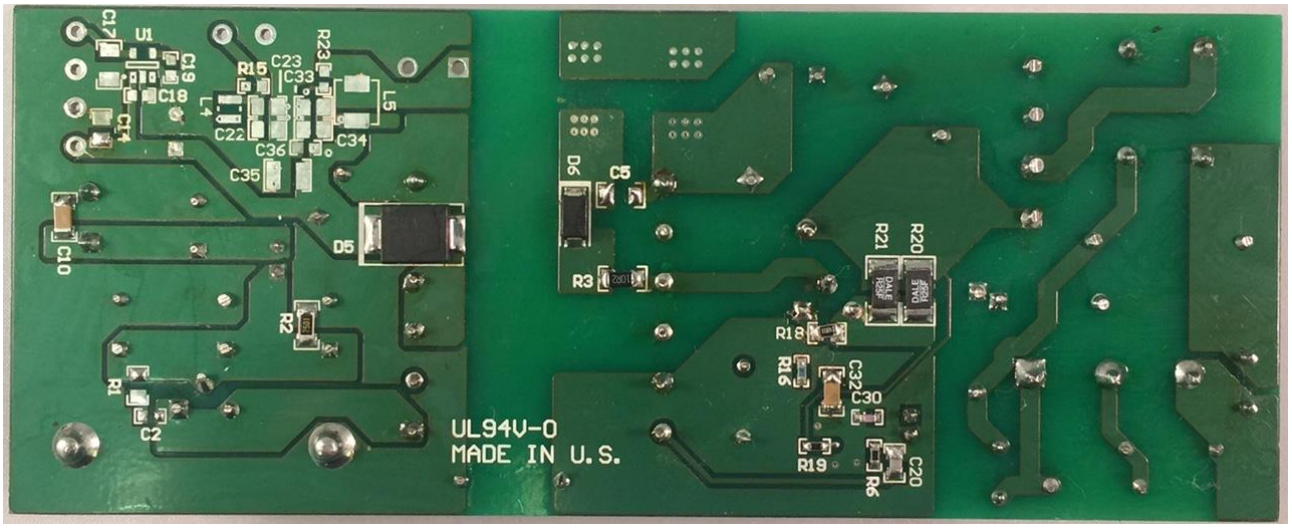
# 1 Photo

The photographs below show the PMP10804 Rev A assembly. This circuit was built on a PMP10804 Rev A PCB.

### Top side

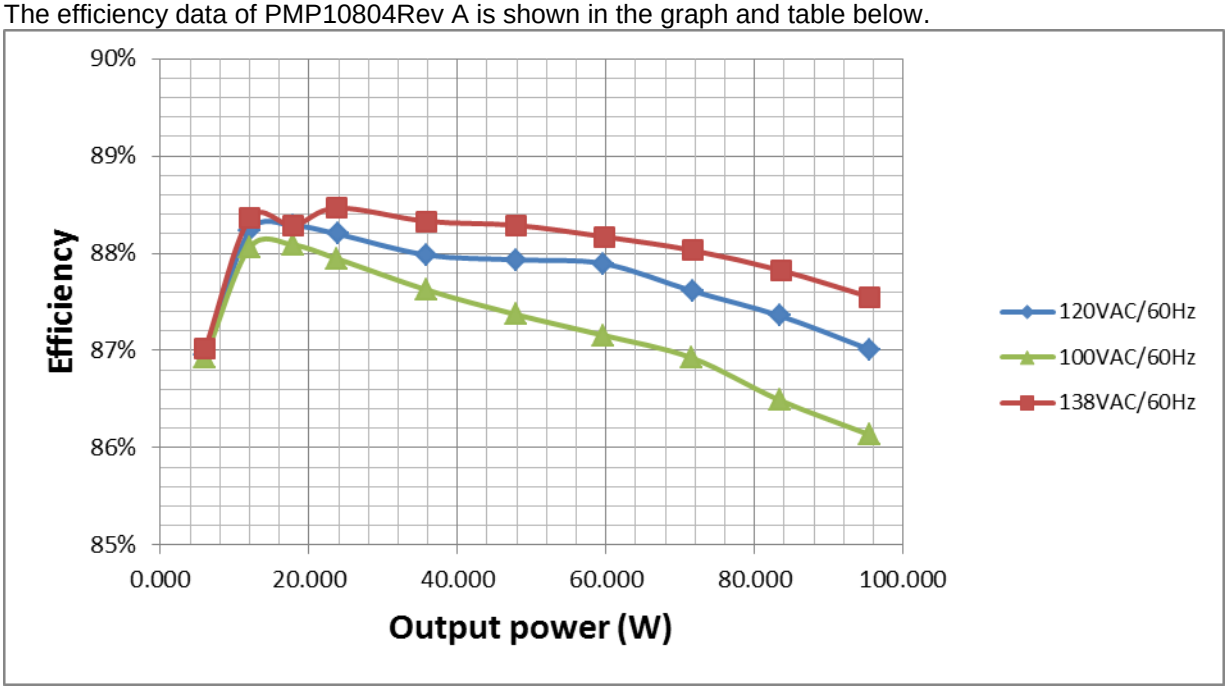



### Bottom side



## 2 Converter Efficiency

The efficiency data of PMP10804Rev A is shown in the graph and table below.




**100V/60Hz**

| Vin(AC) | Iin(A) | Pin(W) | Vout(V) | Iout(A) | Pout(W) | Eff. (%) |
|---|---|---|---|---|---|---|
| 99.99 | 1.65800 | 110.820 | 23.810 | 4.01 | 95.454 | 86.13% |
| 100.29 | 1.45400 | 96.380 | 23.810 | 3.50 | 83.359 | 86.49% |
| 100.01 | 1.25900 | 82.270 | 23.830 | 3.00 | 71.514 | 86.93% |
| 100.09 | 1.06200 | 68.410 | 23.840 | 2.50 | 59.624 | 87.16% |
| 100.03 | 0.86600 | 54.740 | 23.830 | 2.01 | 47.827 | 87.37% |
| 100.29 | 0.66380 | 40.930 | 23.830 | 1.51 | 35.864 | 87.62% |
| 100.56 | 0.45460 | 27.070 | 23.830 | 1.00 | 23.806 | 87.94% |
| 100.19 | 0.35170 | 20.290 | 23.830 | 0.75 | 17.873 | 88.09% |
| 100.06 | 0.24860 | 13.633 | 24.010 | 0.50 | 12.005 | 88.06% |
| 100.25 | 0.13684 | 6.900 | 23.990 | 0.25 | 5.998 | 86.92% |
| 100.49 | 0.01156 | 0.093 | 24.260 | 0.00 | 0.000 | 0.00% |

### 120V/60Hz

| Vin(AC) | Iin(A) | Pin(W) | Vout(V) | Iout(A) | Pout(W) | Eff. (%) |
|---|---|---|---|---|---|---|
| 120.06 | 1.41600 | 109.750 | 23.820 | 4.01 | 95.494 | 87.01% |
| 120.27 | 1.24800 | 95.560 | 23.830 | 3.50 | 83.476 | 87.36% |
| 120.08 | 1.08500 | 81.880 | 23.840 | 3.01 | 71.735 | 87.61% |
| 120.28 | 0.91500 | 67.920 | 23.850 | 2.50 | 59.697 | 87.89% |
| 119.76 | 0.74970 | 54.490 | 23.850 | 2.01 | 47.915 | 87.93% |
| 120.01 | 0.57700 | 40.780 | 23.840 | 1.51 | 35.879 | 87.98% |
| 120.07 | 0.39880 | 27.030 | 23.840 | 1.00 | 23.840 | 88.20% |
| 120.19 | 0.30760 | 20.190 | 23.830 | 0.75 | 17.825 | 88.29% |
| 120.01 | 0.21740 | 13.601 | 24.000 | 0.50 | 12.000 | 88.23% |
| 120.17 | 0.12095 | 6.926 | 24.090 | 0.25 | 6.023 | 86.95% |
| 120.35 | 0.01362 | 0.095 | 24.380 | 0.00 | 0.000 | 0.00% |

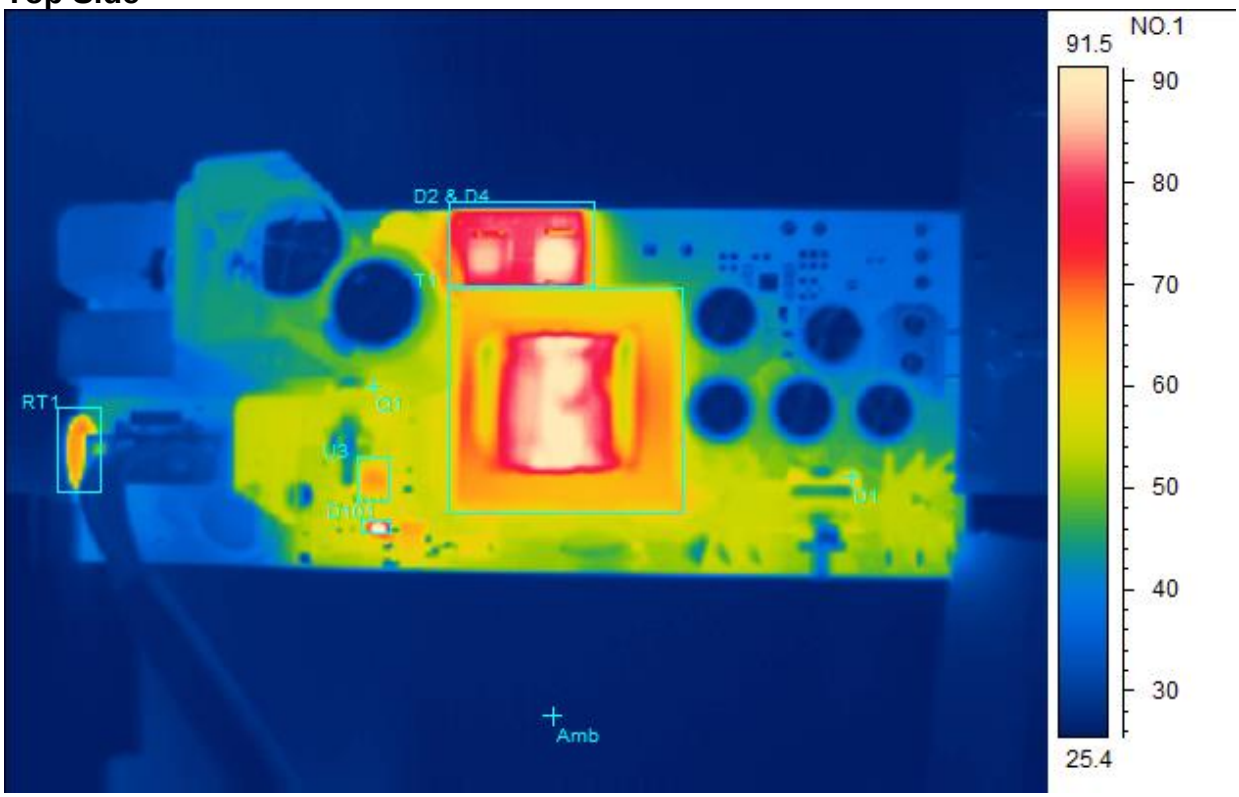
### 138V/60Hz

| Vin(AC) | Iin(A) | Pin(W) | Vout(V) | Iout(A) | Pout(W) | Eff. (%) |
|---|---|---|---|---|---|---|
| 137.95 | 1.25700 | 109.120 | 23.830 | 4.01 | 95.534 | 87.55% |
| 138.16 | 1.11000 | 95.200 | 23.840 | 3.51 | 83.607 | 87.82% |
| 138.04 | 0.96400 | 81.470 | 23.850 | 3.01 | 71.717 | 88.03% |
| 138.25 | 0.81600 | 67.760 | 23.850 | 2.51 | 59.744 | 88.17% |
| 138.40 | 0.66470 | 54.190 | 23.850 | 2.01 | 47.843 | 88.29% |
| 138.18 | 0.51270 | 40.620 | 23.840 | 1.51 | 35.879 | 88.33% |
| 137.97 | 0.35340 | 26.910 | 23.830 | 1.00 | 23.806 | 88.47% |
| 138.09 | 0.27390 | 20.190 | 23.830 | 0.75 | 17.825 | 88.29% |
| 138.26 | 0.19451 | 13.581 | 24.000 | 0.50 | 12.000 | 88.36% |
| 138.42 | 0.10877 | 6.900 | 23.920 | 0.25 | 6.004 | 87.01% |
| 138.07 | 0.01550 | 0.096 | 24.260 | 0.00 | 0.000 | 0.00% |

# 3 Thermal Images

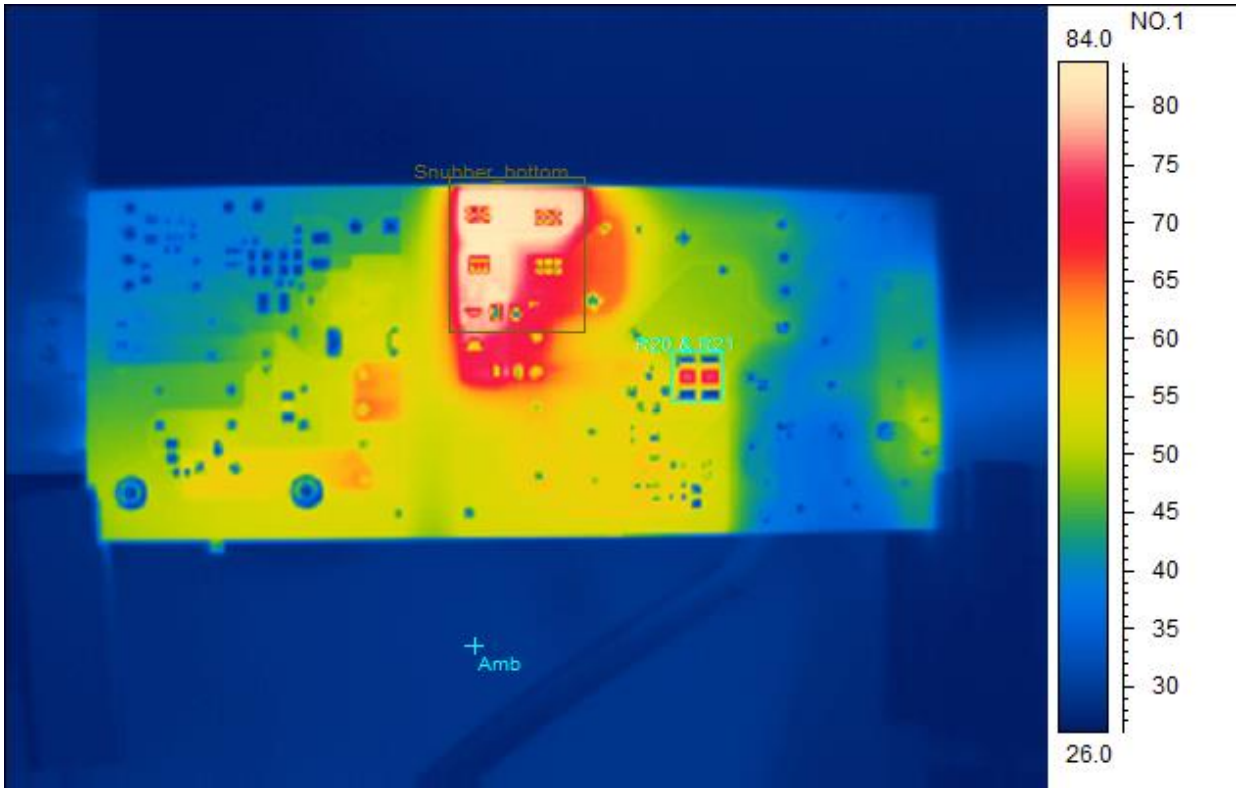
The thermal images below show a top view and bottom view of the board at $120V_{AC}$/60Hz input. The ambient temperature was 20ºC with no forced air flow. The outputs were loaded with 24V/4A.

**Top Side**




| Spot analysis | Value |
|---|---|
| D1Temperature | 64.2°C |
| Q1Temperature | 61.5°C |
| Amb Temperature | 26.3°C |
| **Area analysis** | **Value** |
| D2 & D4Max | 92.2°C |
| T1Max | 93.8°C |
| D101Max | 98.3°C |
| U3Max | 70.7°C |
| RT1Max | 71.8°C |

## Bottom Side

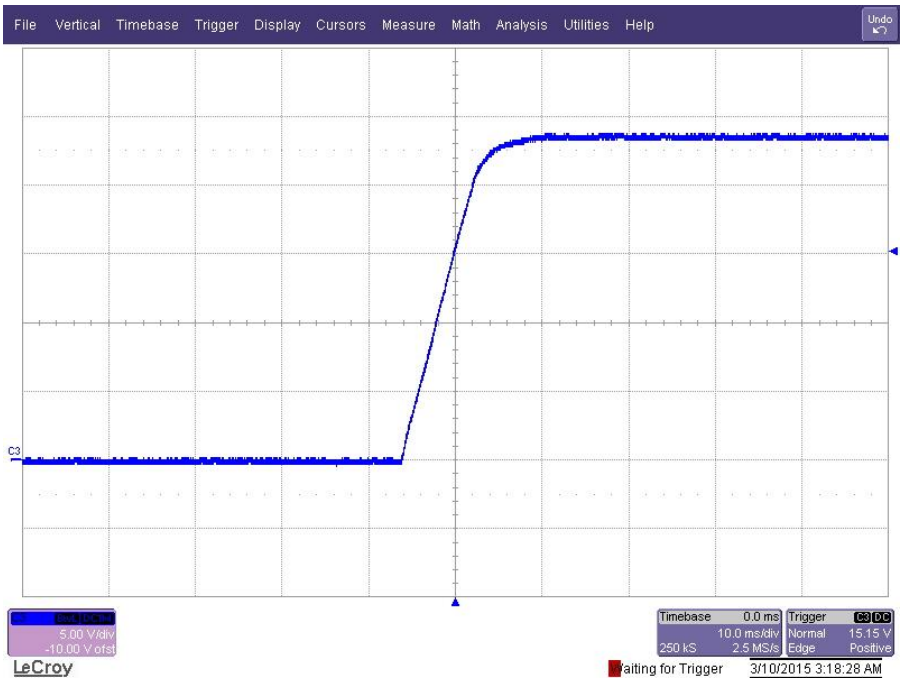



| Spot analysis | Value |
|---|---|
| AmbTemperature | 29.8°C |
| **Area analysis** | **Value** |
| Snubber_bottomMax | 85.2°C |
| R20 & R21 Max | 76.2°C |

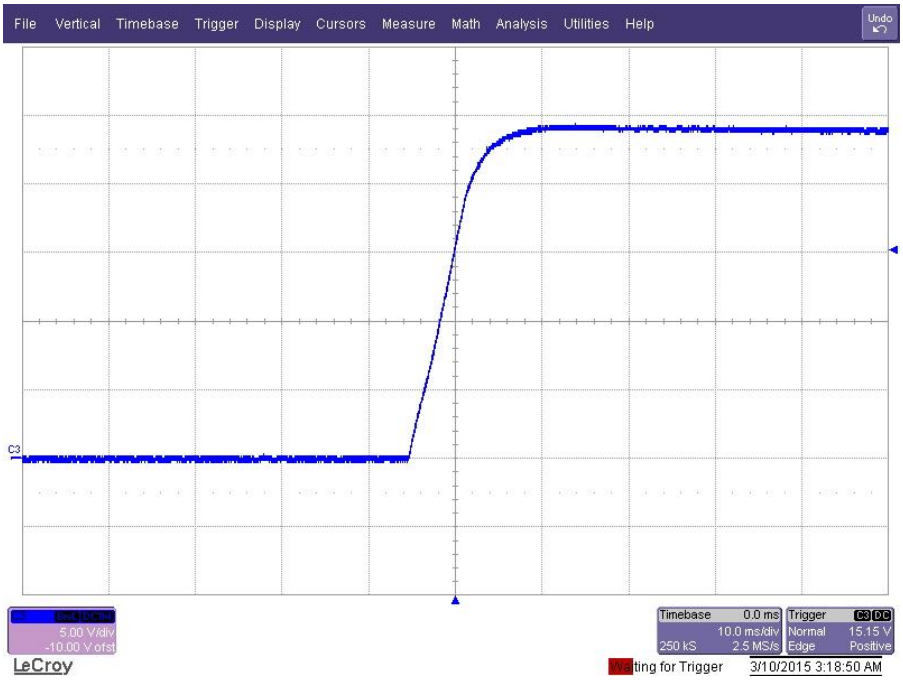
# 4 Startup

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

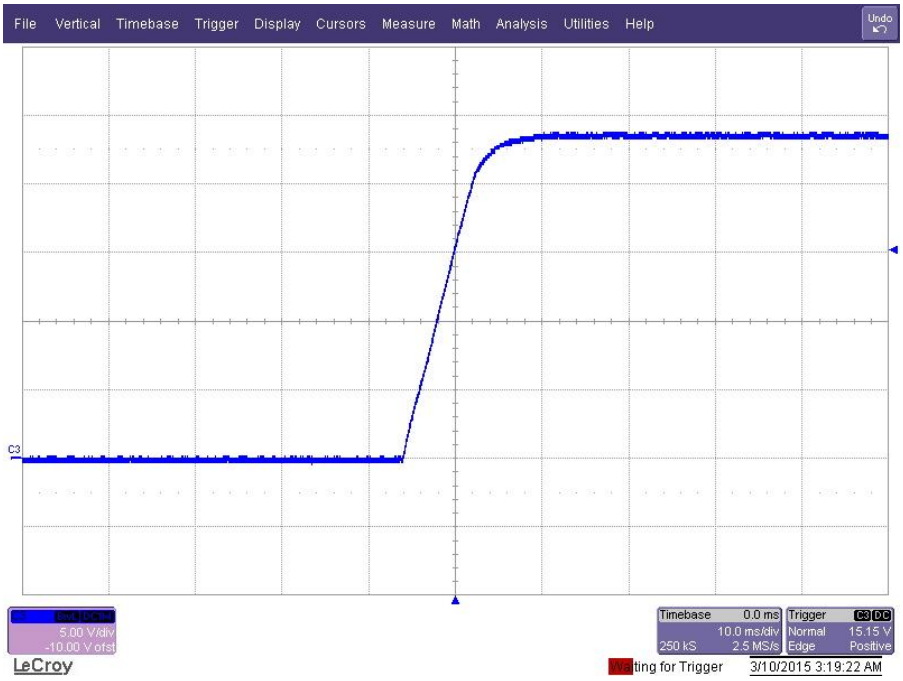
## 4.1 24V/4A startup @ 100$V_{AC}$/60Hz.



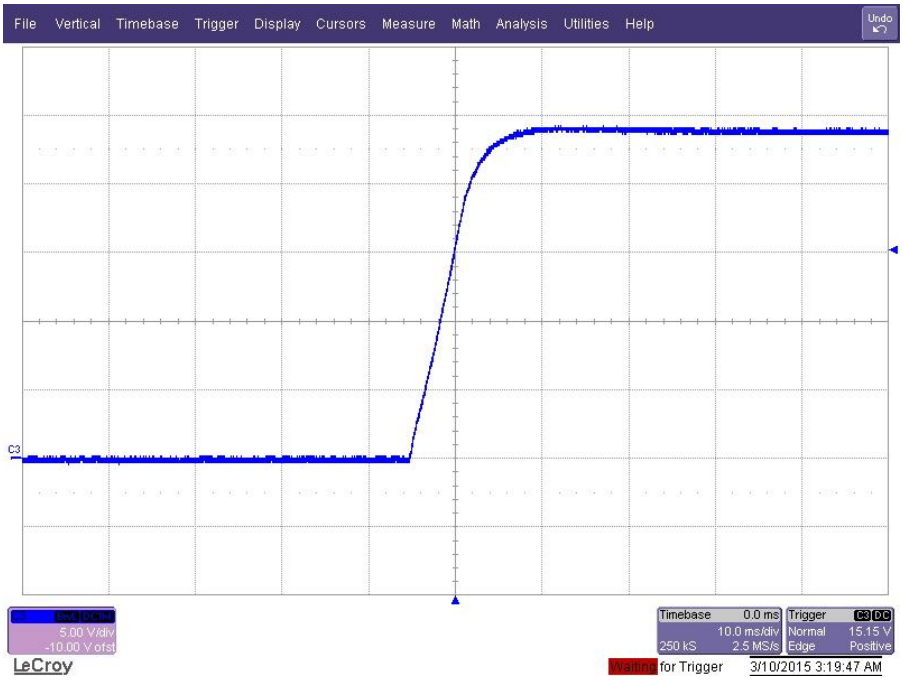

## 4.2 No load startup @ 100$V_{AC}$/60Hz.



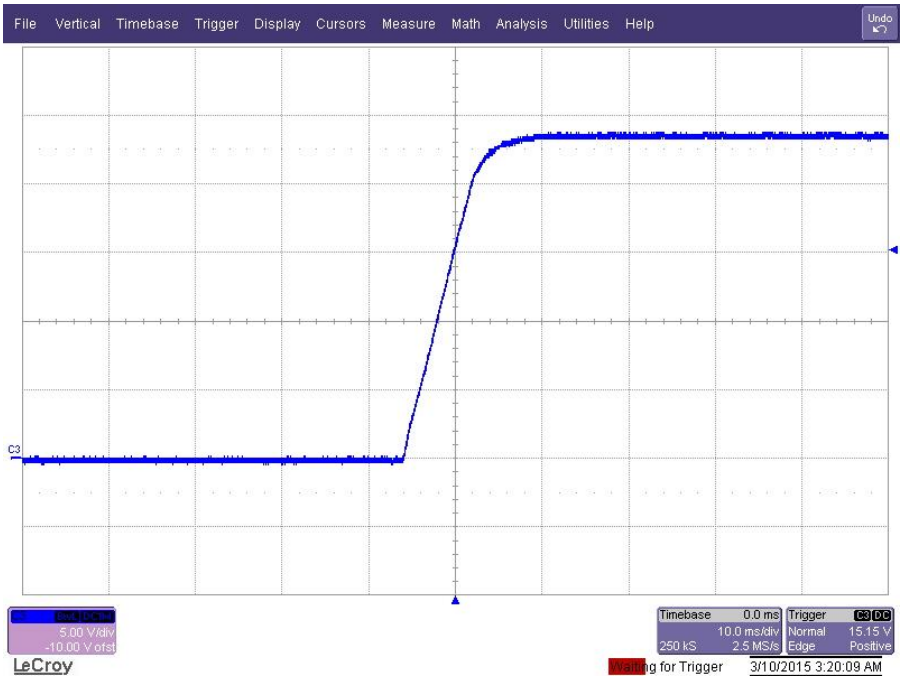
### 4.3 24V/4A startup @ 120$V_{AC}$/60Hz.



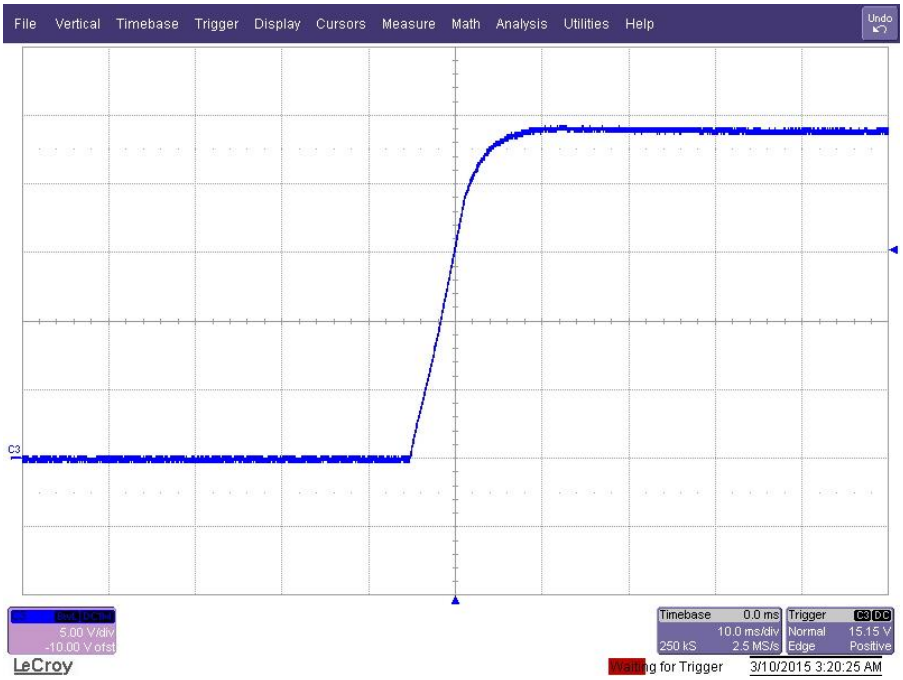

### 4.4 No load startup @ 120$V_{AC}$/60Hz.



### 4.5 24V/4A startup @ 138$V_{AC}$/60Hz.



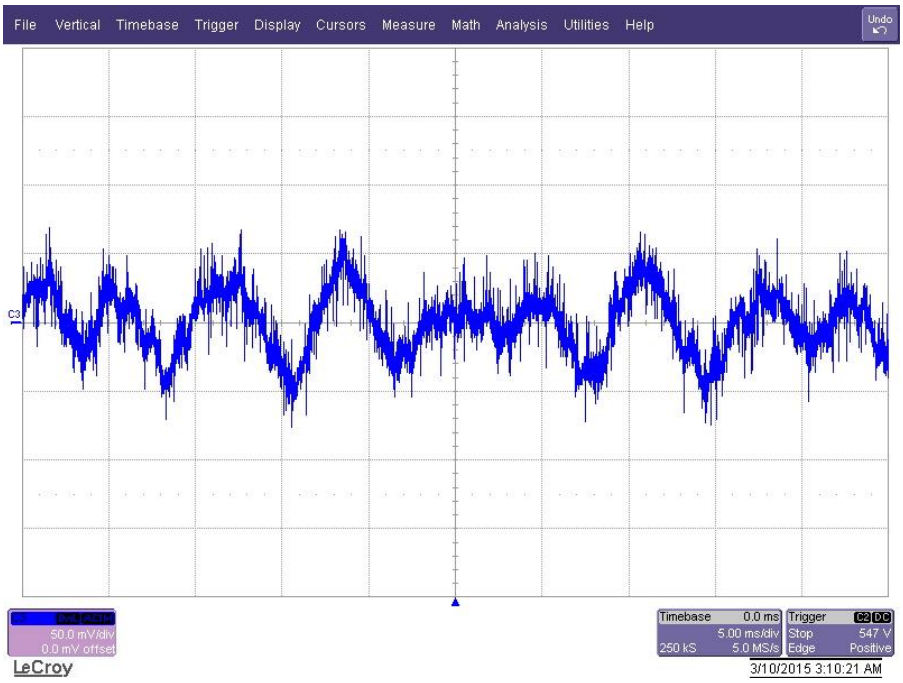

### 4.6 No load startup @ 138$V_{AC}$/60Hz.



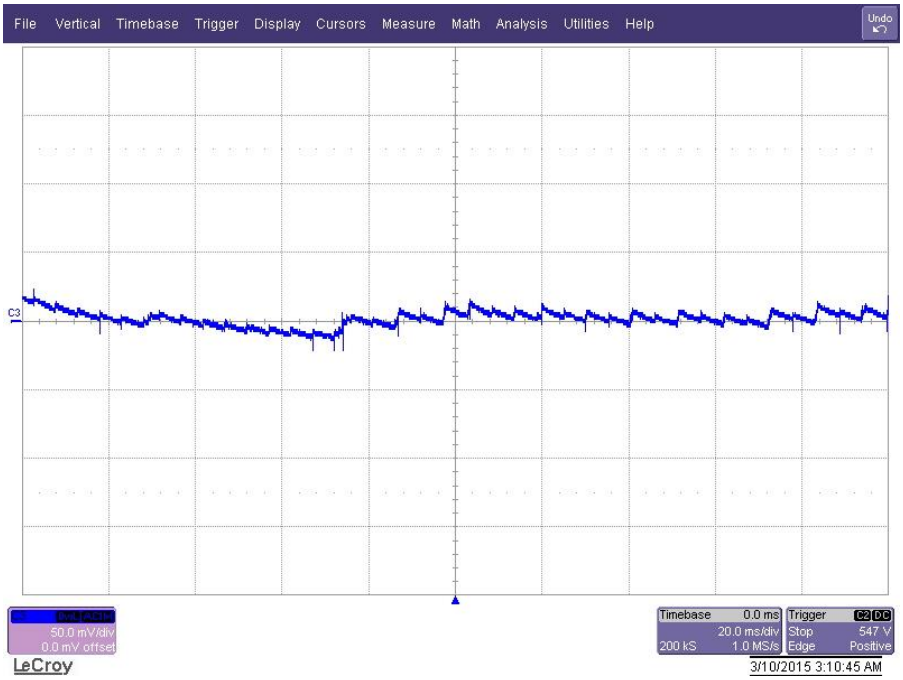
# 5 Output Ripple Voltages

The output ripple voltages are shown in the plots below.

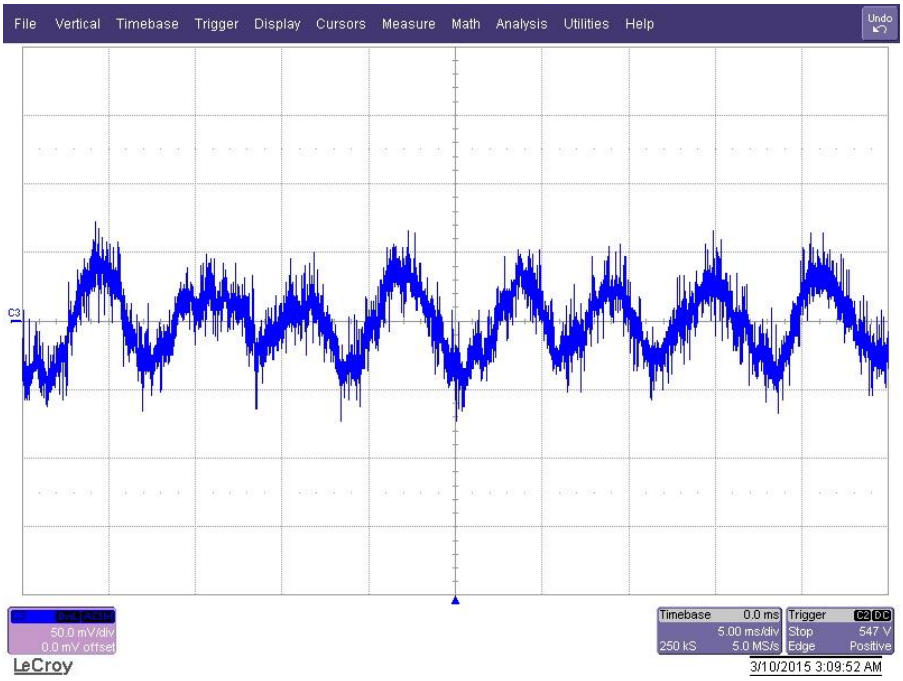
## 5.1 24V/4A @ 100$V_{AC}$/60Hz.



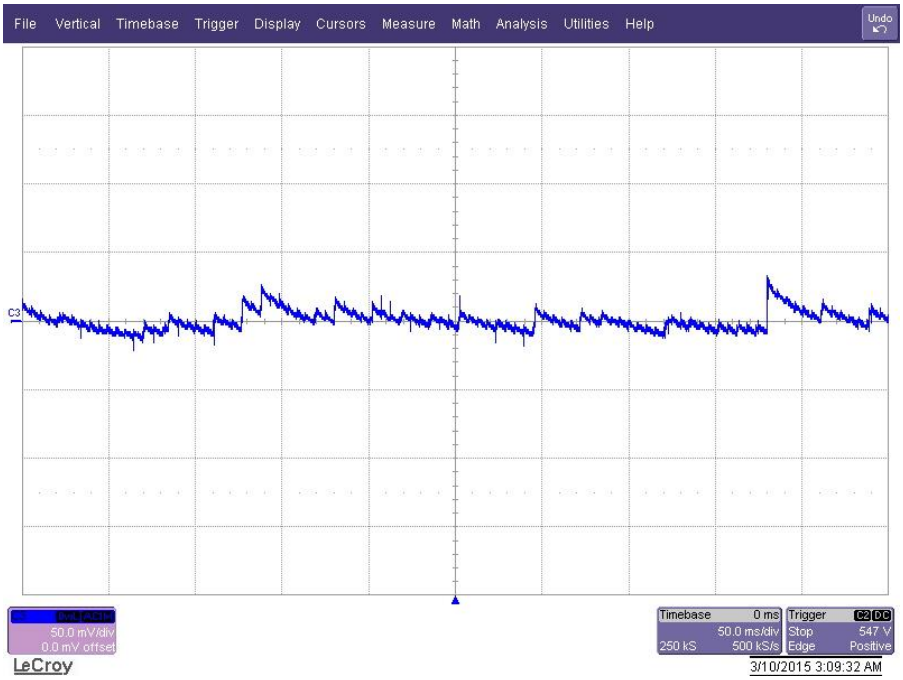

## 5.2 No load @ 100$V_{AC}$/60Hz.



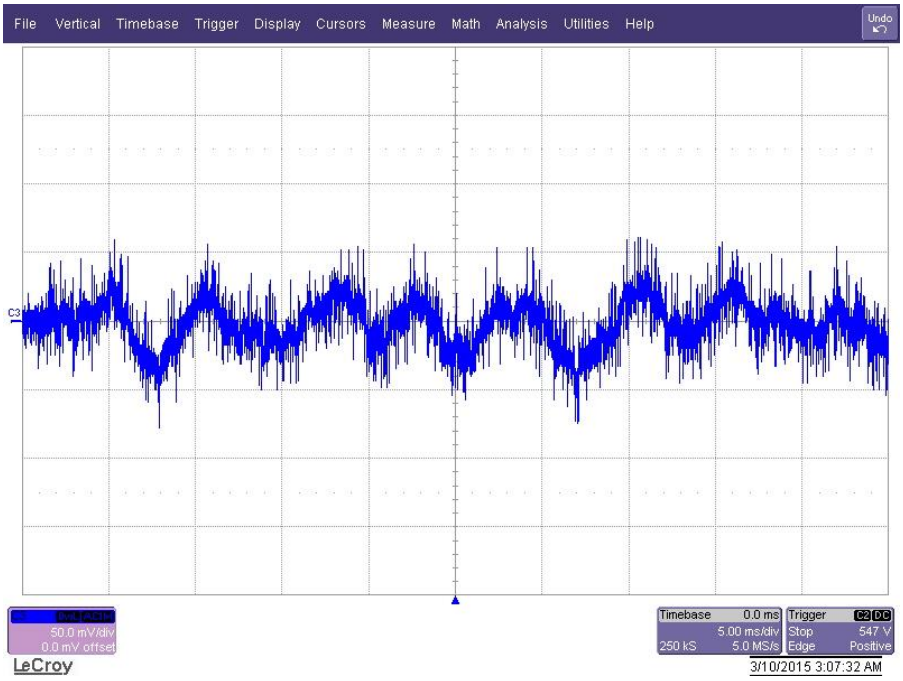
### 5.3 24V/4A @ 120$V_{AC}$/60Hz.



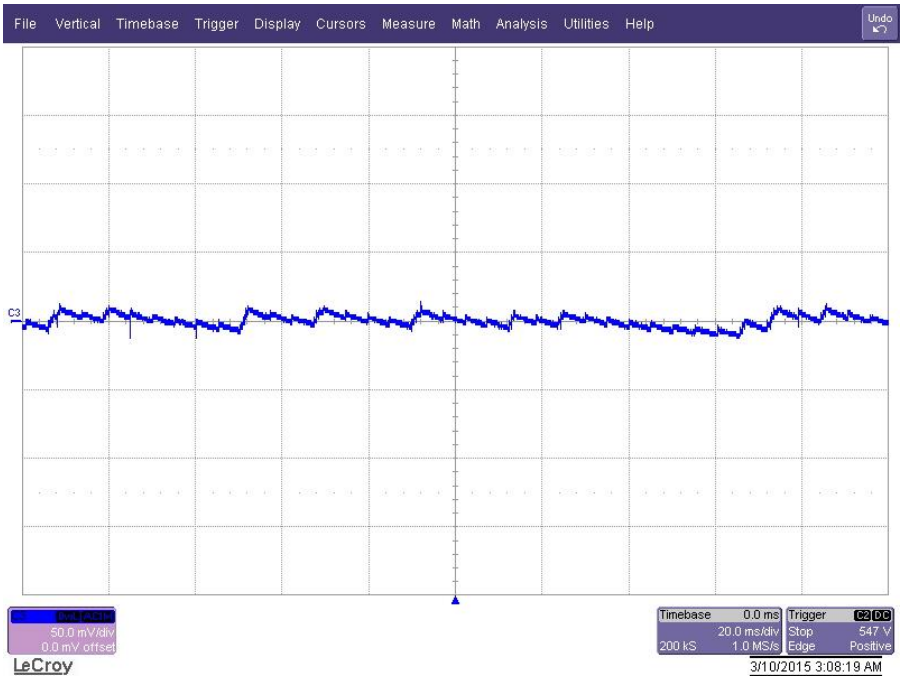

### 5.4 No load @ 120$V_{AC}$/60Hz.



### 5.5 24V/4A @ 138$V_{AC}$/60Hz.

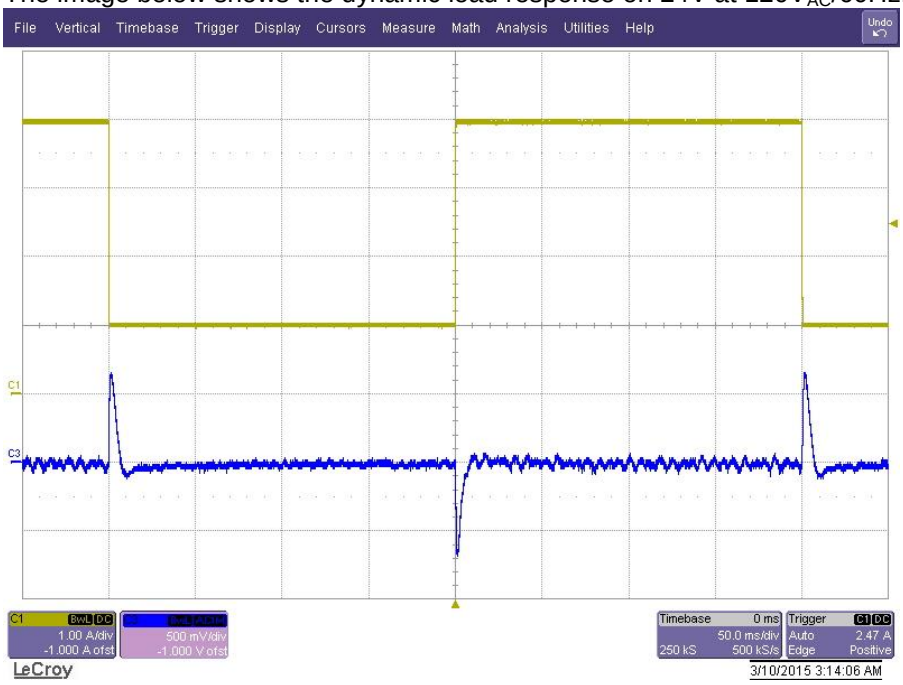



### 5.6 No load @ 138$V_{AC}$/60Hz.



# 6 Dynamic Load Response

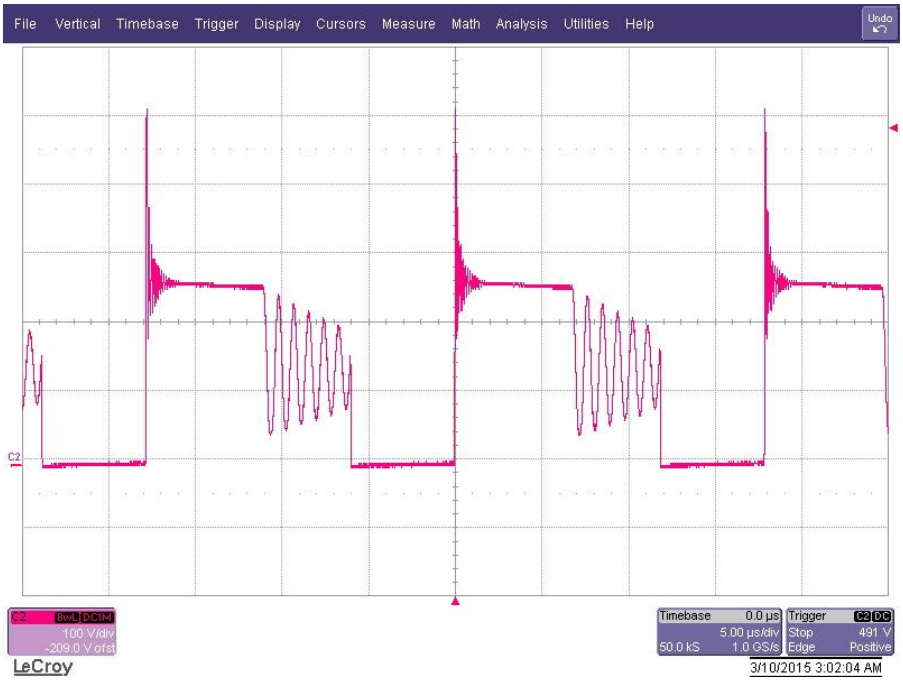
The image below shows the dynamic load response on 24V at 120$V_{AC}$/60Hz. Load step is from 1A to 4A.



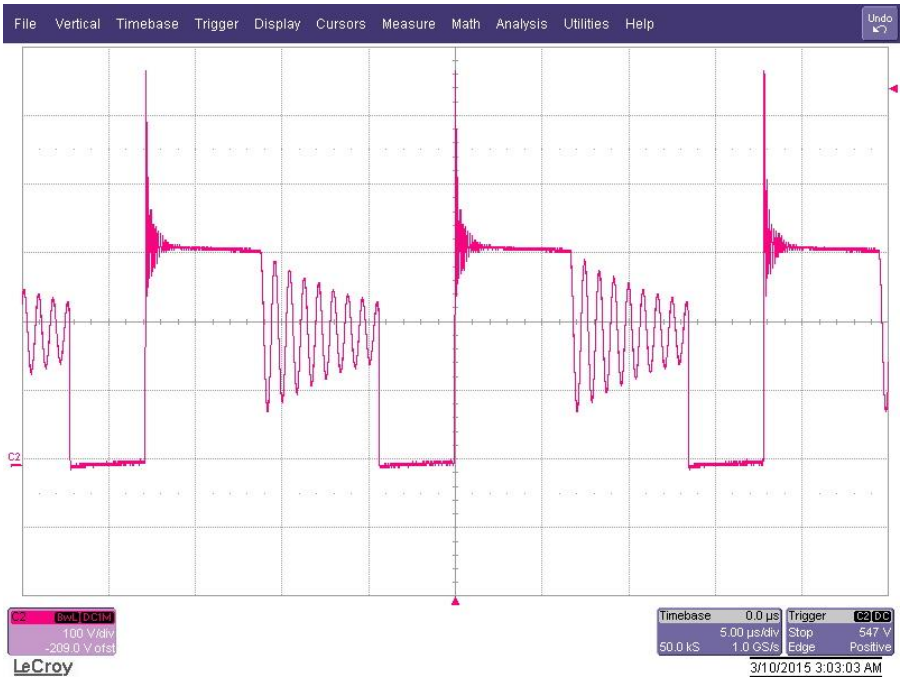
# 7 Switching Waveforms

The images below show key switching waveforms of PMP10804RevA. The waveforms are measured at full load.

## 7.1 Voltage at Q1 Drain @ 100$V_{AC}$/60Hz input and 24V/4A output.




## 7.2 Voltage at Q1 Drain @ 138$V_{AC}$/60Hz input and 24V/4A output.



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