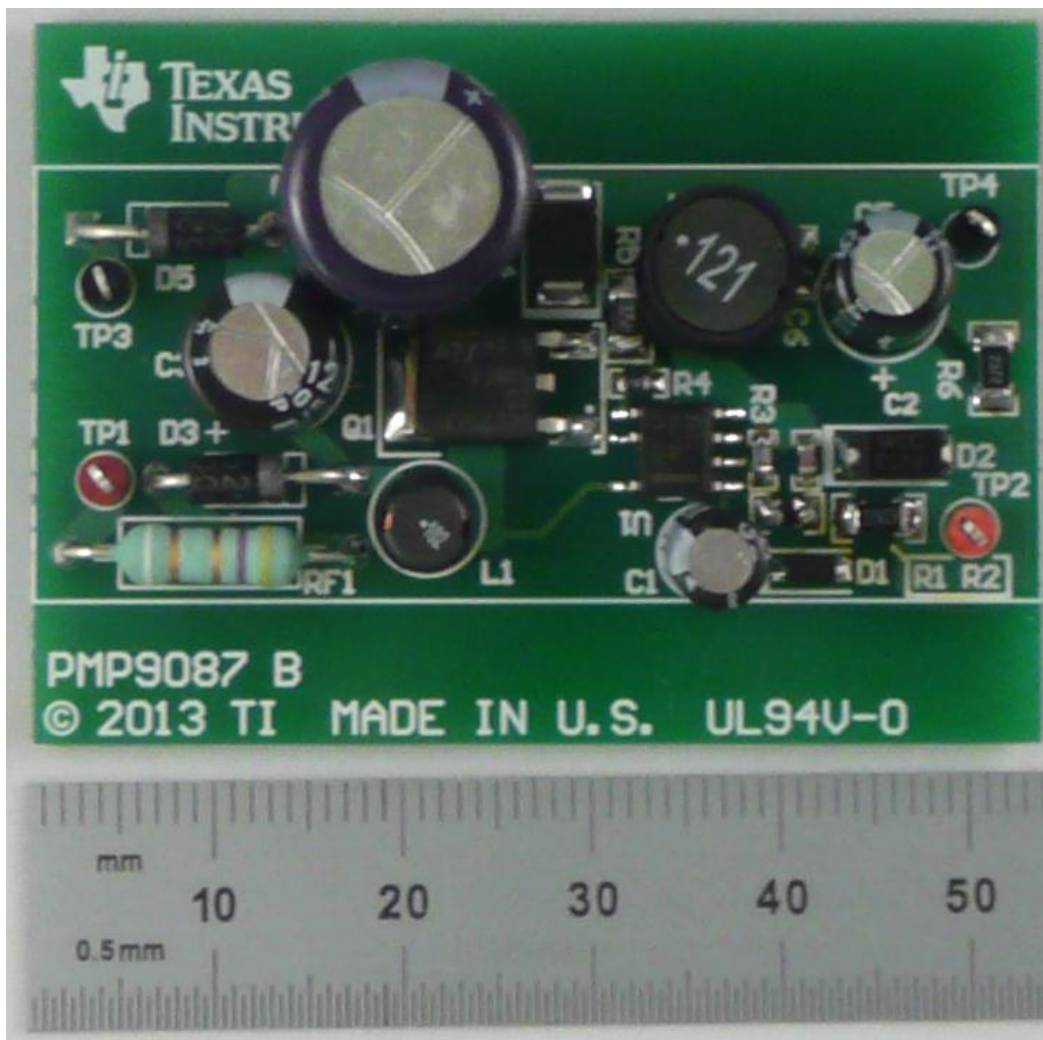


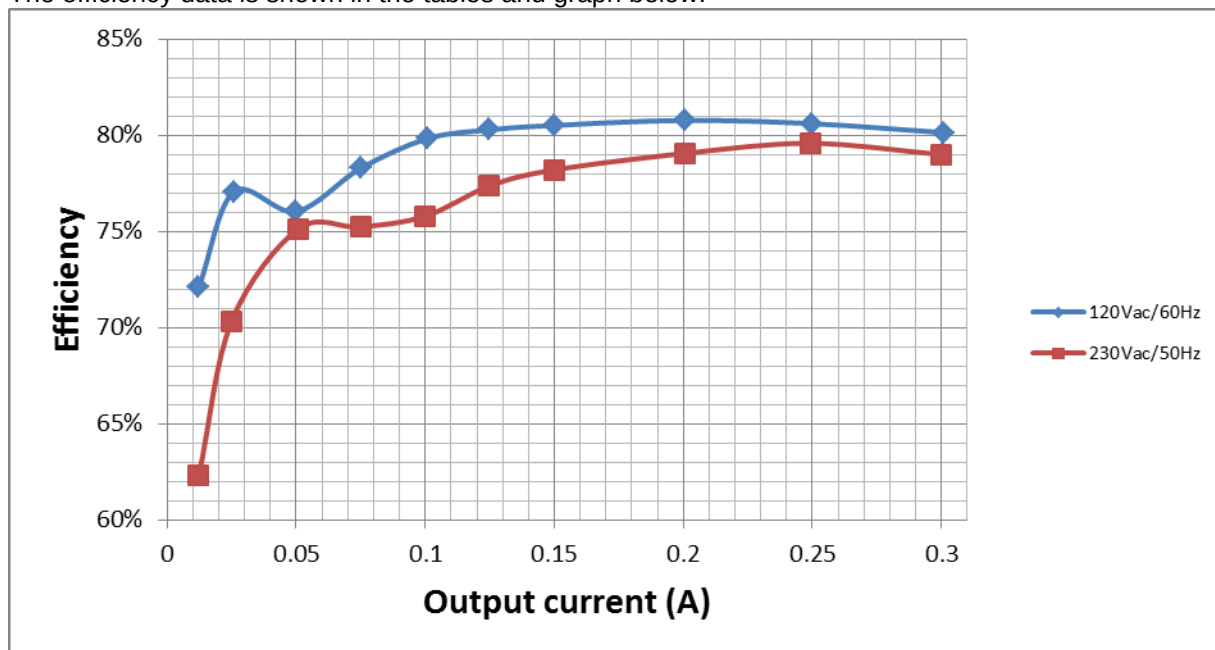
## 1 Photo

The photographs below show the PMP9530 Rev A assembly. This circuit was built on a PMP9087 Rev B PCB.



## 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 (%) |
|--------|---------|---------|---------|---------|----------|-----------|----------------|
| 119.92 | 144.1   | 6.873   | 18.31   | 0.3008  | 5.507648 | 1.365352  | 80.13%         |
| 119.95 | 122.19  | 5.673   | 18.29   | 0.25    | 0.2499   | 5.4231    | 80.60%         |
| 119.99 | 101.61  | 4.547   | 18.29   | 0.2008  | 3.672632 | 0.874368  | 80.77%         |
| 120.05 | 79.76   | 3.403   | 18.29   | 0.1498  | 2.739842 | 0.663158  | 80.51%         |
| 120.07 | 68.46   | 2.845   | 18.3    | 0.1248  | 2.28384  | 0.56116   | 80.28%         |
| 120.11 | 57.58   | 2.313   | 18.3    | 0.1009  | 1.84647  | 0.46653   | 79.83%         |
| 120.13 | 46.03   | 1.751   | 18.3    | 0.0749  | 1.37067  | 0.38033   | 78.28%         |
| 120.14 | 33.15   | 1.203   | 18.33   | 0.0499  | 0.914667 | 0.288333  | 76.03%         |
| 120.16 | 18.405  | 0.6121  | 18.24   | 0.02586 | 0.471686 | 0.1404136 | 77.06%         |
| 120.17 | 9.916   | 0.3102  | 18.27   | 0.01224 | 0.223625 | 0.0865752 | 72.09%         |
| 120.07 | 1.588   | 0.05152 | 18.4    | 0       | 0        | 0.05152   | 0.00%          |

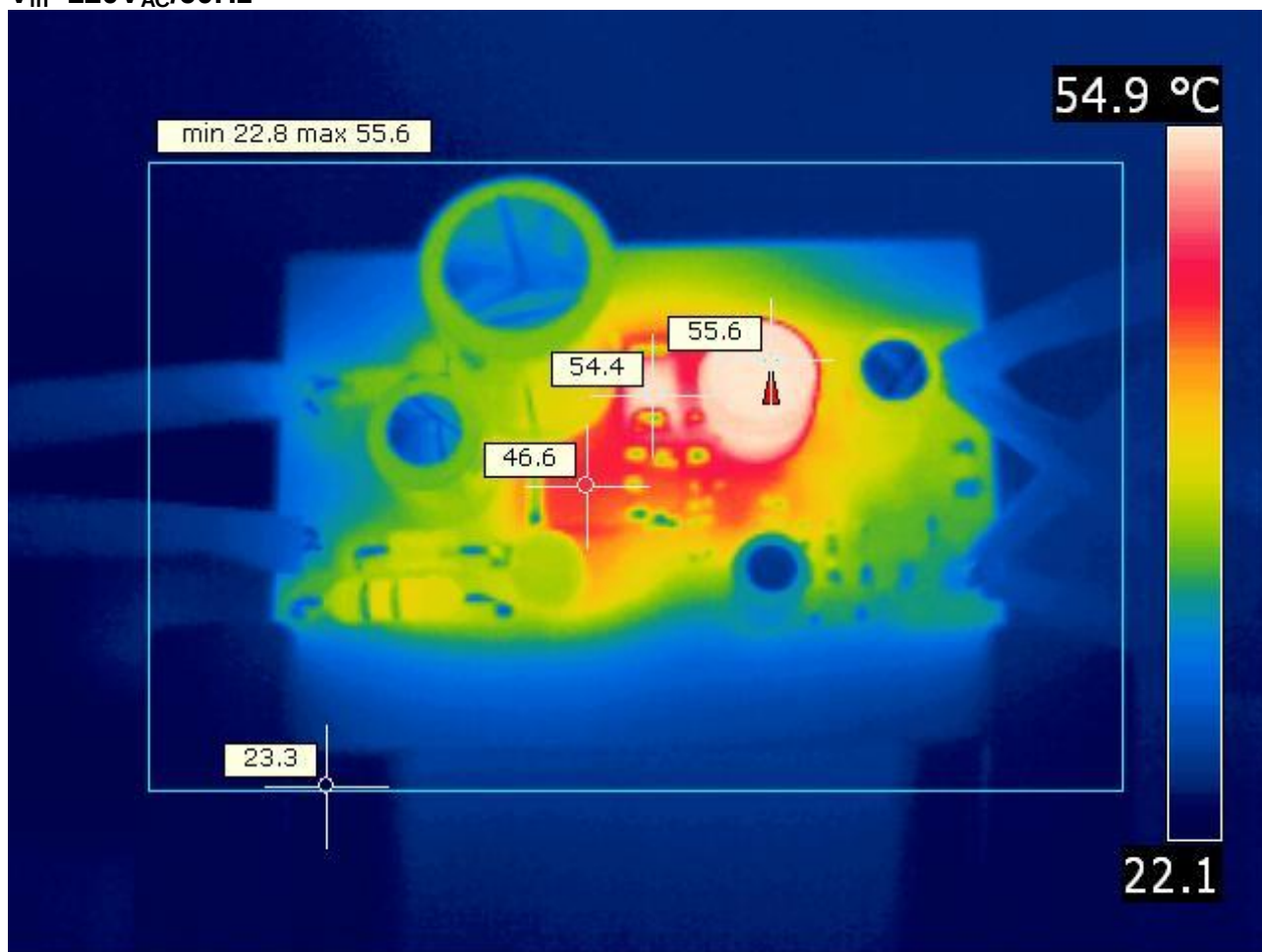
**Vin=230V<sub>AC</sub>/50Hz**

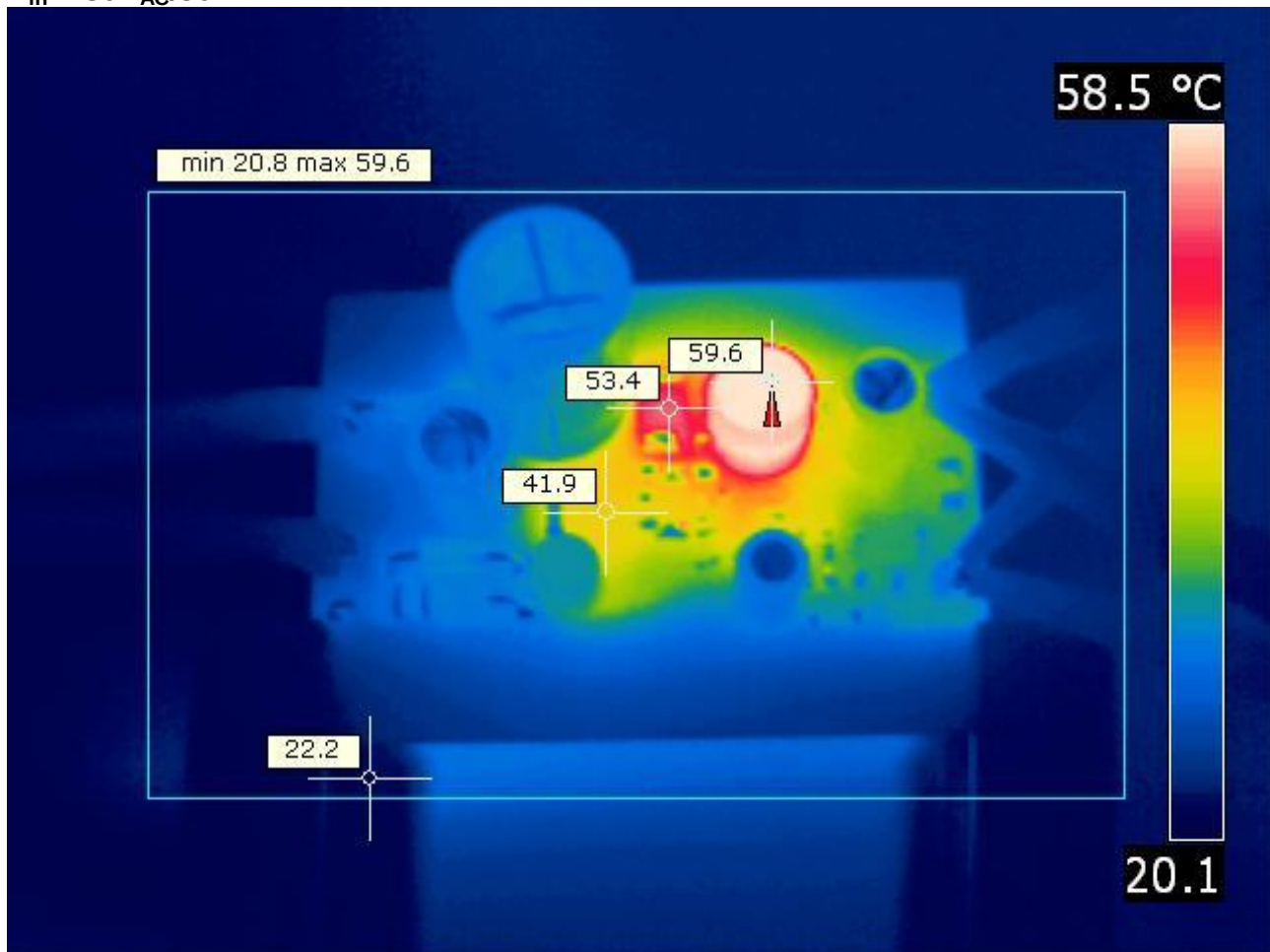
| Vin(V) | Iin(mA) | Pin(W)  | Vout(V) | Iout(A) | Pout(W)  | Losses(W) | Efficiency (%) |
|--------|---------|---------|---------|---------|----------|-----------|----------------|
| 230    | 93.12   | 6.956   | 18.31   | 0.3001  | 5.494831 | 1.461169  | 78.99%         |
| 230.1  | 79.15   | 5.725   | 18.29   | 0.2491  | 4.556039 | 1.168961  | 79.58%         |
| 230.1  | 66.28   | 4.638   | 18.27   | 0.2007  | 3.666789 | 0.971211  | 79.06%         |
| 230.1  | 52.28   | 3.502   | 18.28   | 0.1498  | 2.738344 | 0.763656  | 78.19%         |
| 230.1  | 45.1    | 2.949   | 18.28   | 0.1248  | 2.281344 | 0.667656  | 77.36%         |
| 230.1  | 37.99   | 2.411   | 18.29   | 0.0999  | 1.827171 | 0.583829  | 75.78%         |
| 230.1  | 29.53   | 1.814   | 18.22   | 0.0749  | 1.364678 | 0.449322  | 75.23%         |
| 230.1  | 20.92   | 1.232   | 18.21   | 0.05083 | 0.925614 | 0.3063857 | 75.13%         |
| 230.2  | 11.464  | 0.6456  | 18.23   | 0.0249  | 0.453927 | 0.191673  | 70.31%         |
| 230.2  | 6.417   | 0.3593  | 18.25   | 0.01227 | 0.223928 | 0.1353725 | 62.32%         |
| 230.2  | 1.079   | 0.09284 | 18.41   | 0       | 0        | 0.09284   | 0.00%          |

### 3 Thermal Images

The thermal images below show a top view and bottom view of the board under 120V<sub>ac</sub>/60Hz and 230V<sub>ac</sub>/50Hz input conditions. The ambient temperature was 20°C with no forced air flow. The output was at full load: 18V/0.3A.

**V<sub>in</sub>=120V<sub>AC</sub>/60Hz**



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

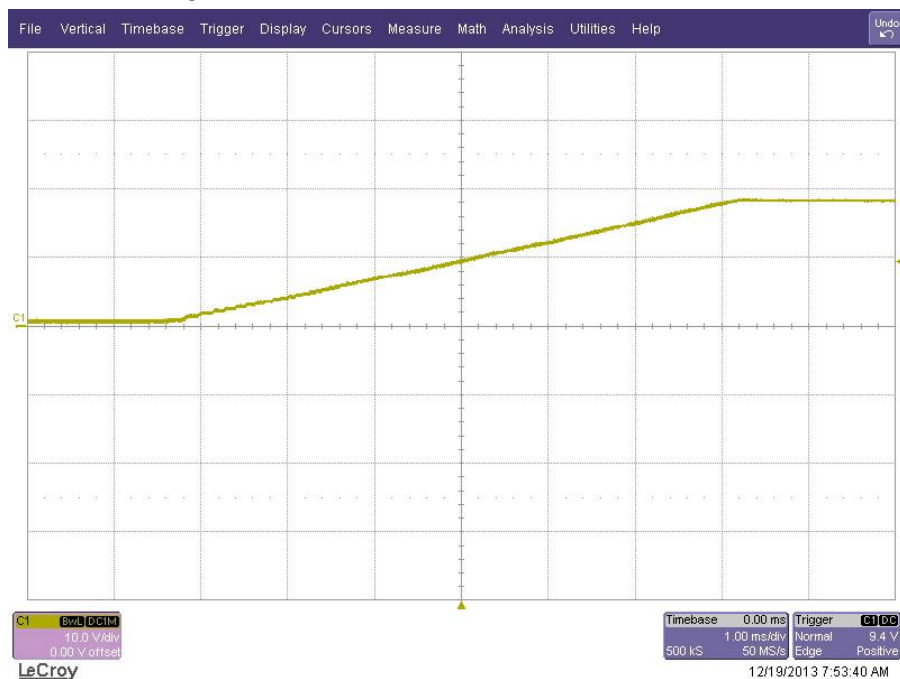
## 4 Startup Waveforms

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

### 4.1 Start Up @ 85V<sub>ac</sub>: 18V/0.3A.



### 4.2 Start Up @ 85V<sub>ac</sub>: no load.



## 5 Turn off

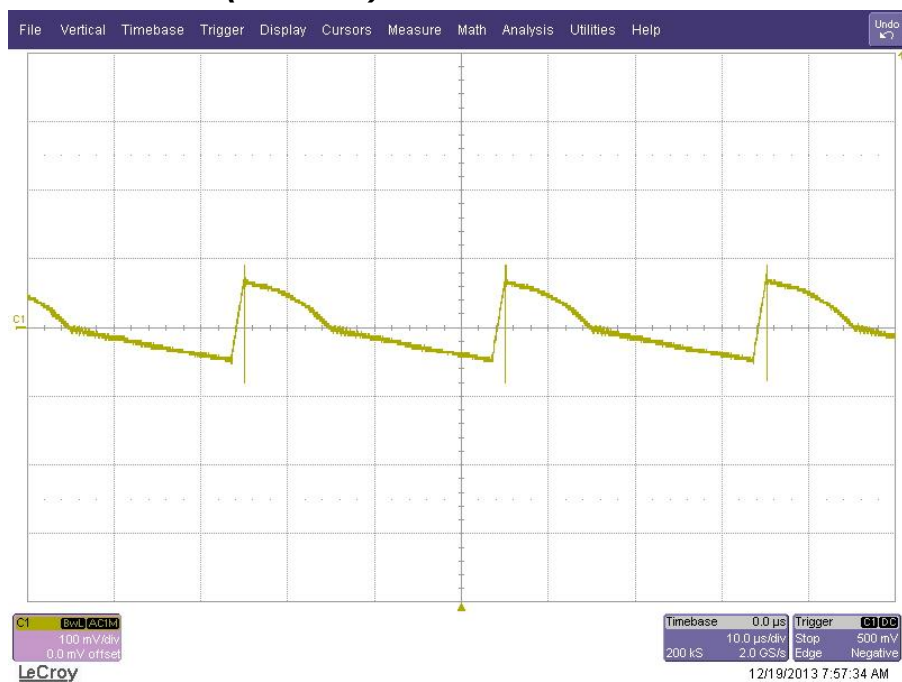
The output voltage at turn off transient is shown in the image below at full load (18V/0.3A) and 85V<sub>ac</sub>/60Hz input.



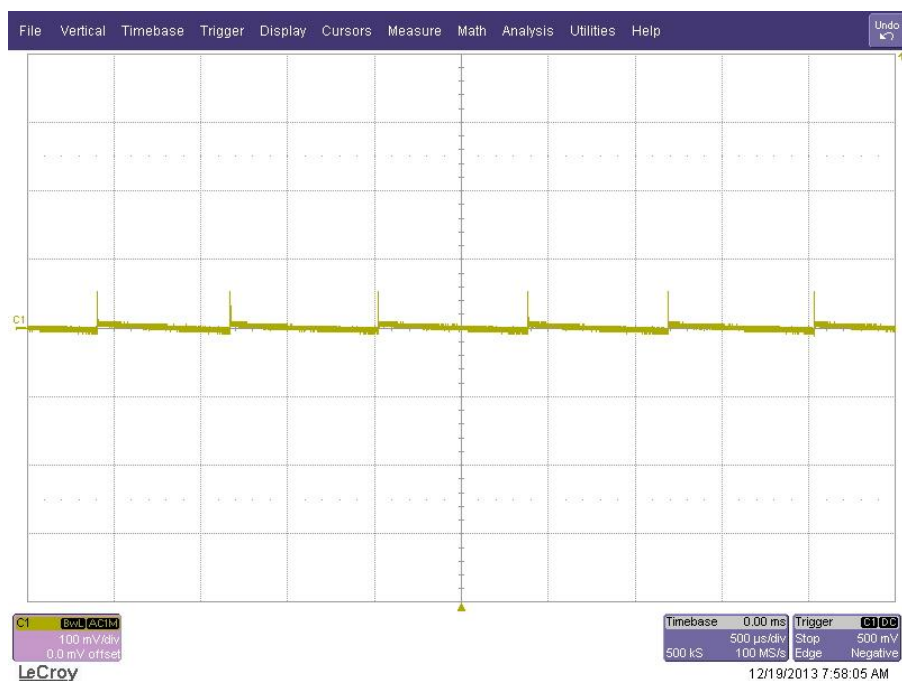
## 6 Output Ripple Voltages

The output ripple voltages are shown in the plots below with 120V<sub>ac</sub>/60Hz input.

### 6.1 Full load (18V/0.3A)

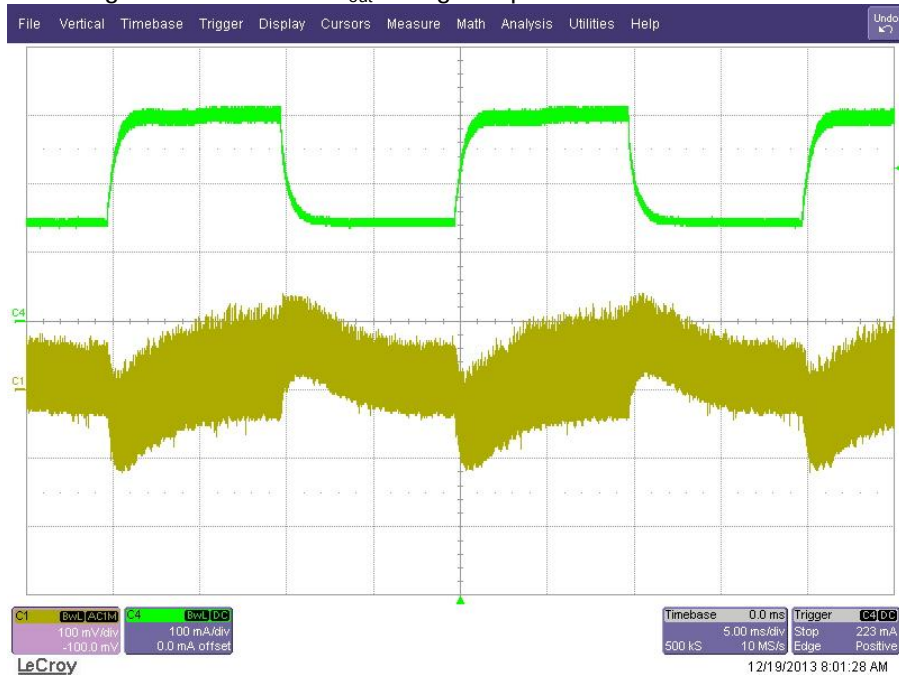


### 6.2 No load



## 7 Load Transient

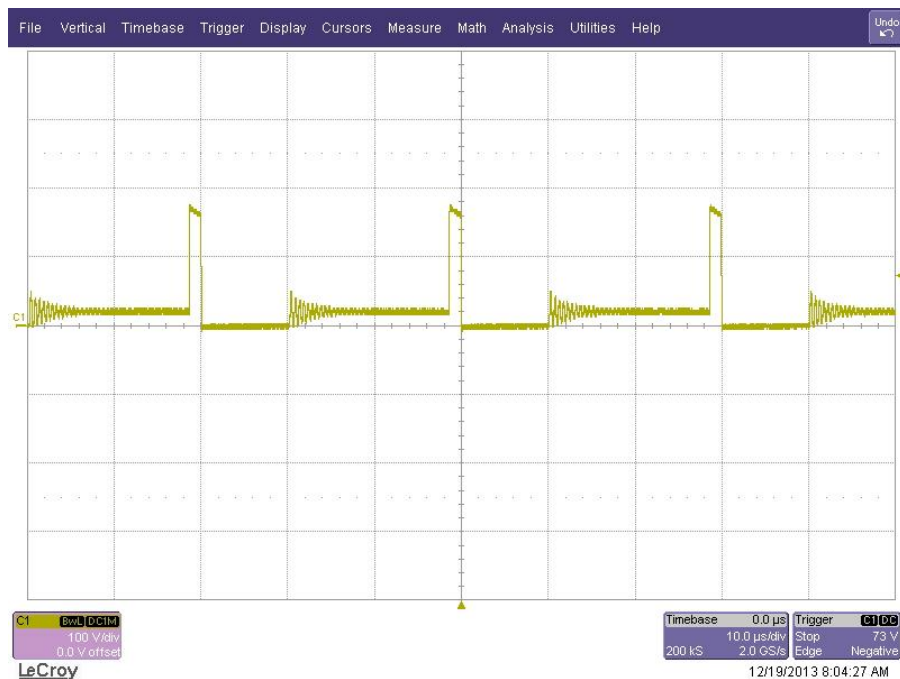
The image below shows  $18V_{out}$  voltage response to a **0.15A** to **0.3A** load transient.



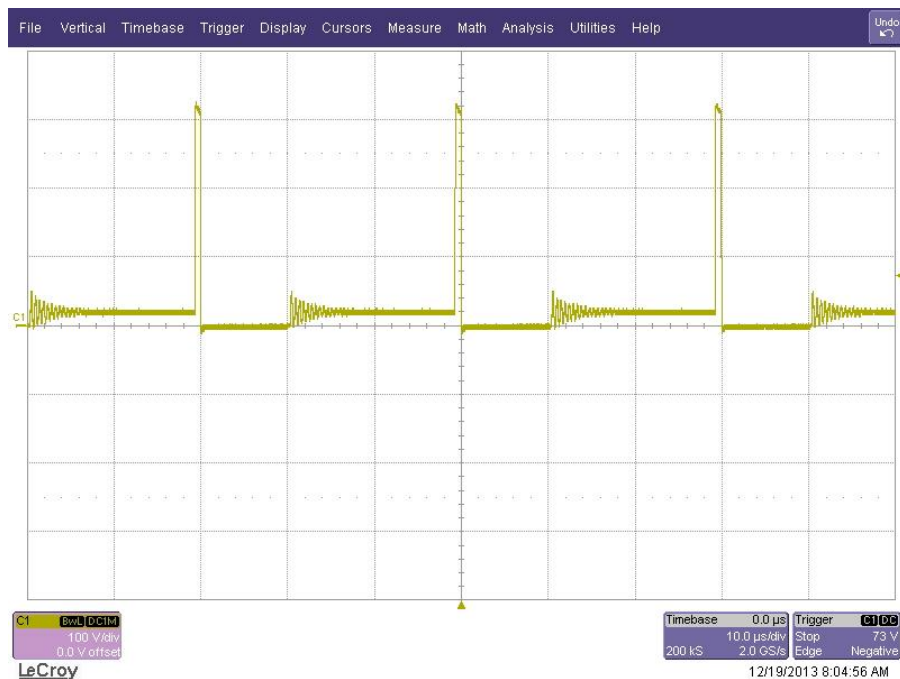
## 8 Switching Waveforms

The images below show key switching waveforms of PMP9530RevA. The waveforms are measured with 0.3A full load.

### 8.1 Diode D4 @ 120V<sub>ac</sub>/60Hz



### 8.2 Diode D4 @ 230V<sub>ac</sub>/50Hz



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