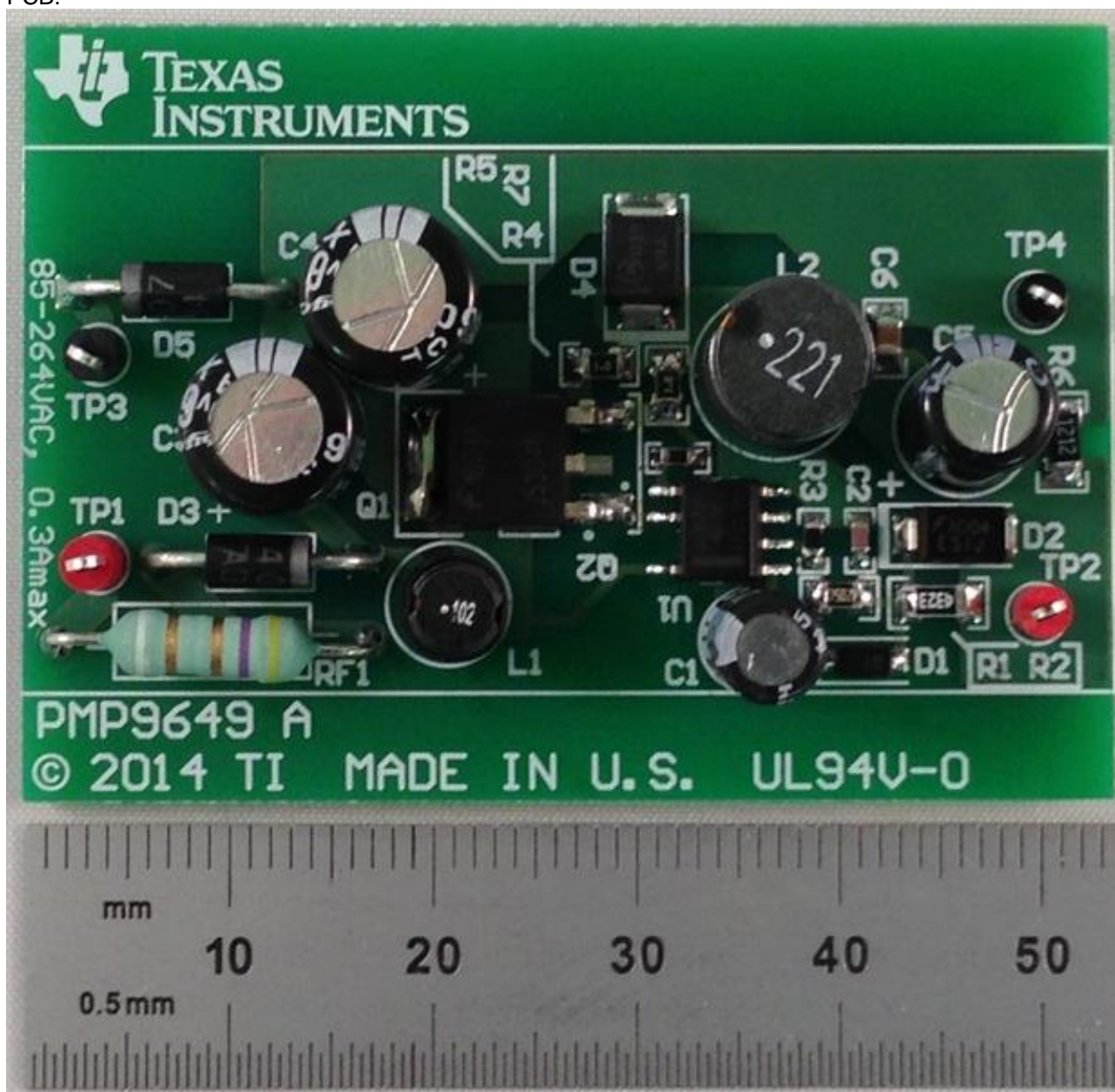


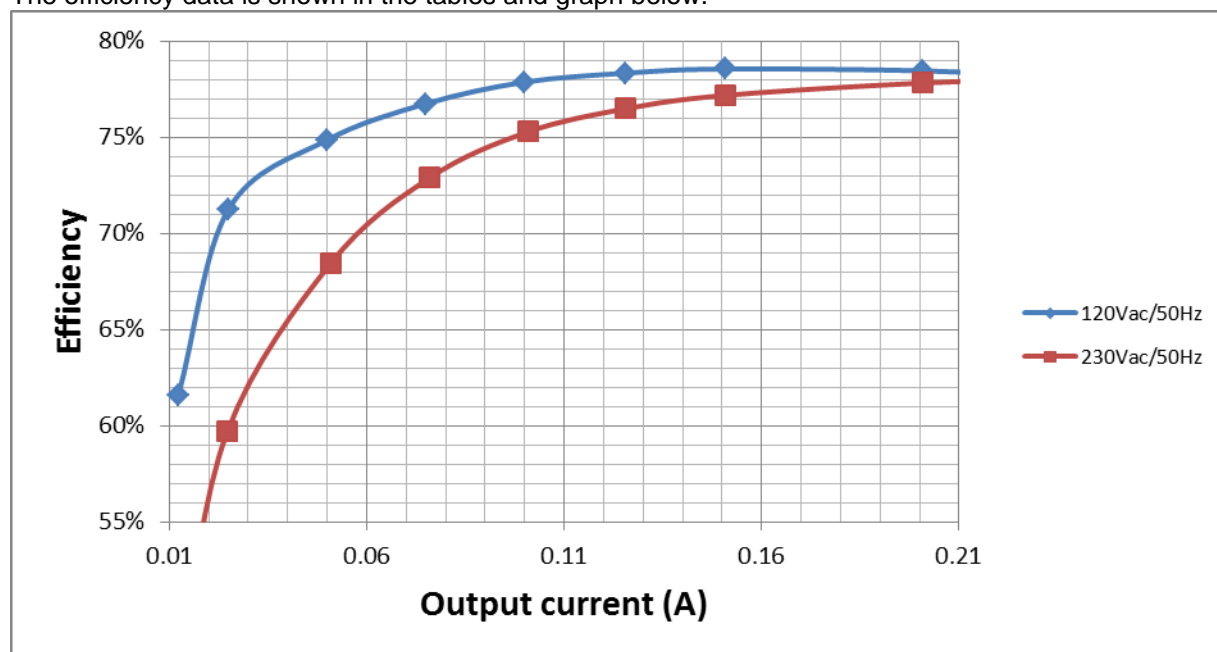
## 1 Photo

The photographs below show the PMP9649 Rev A assembly. This circuit was built on a PMP9649 Rev A PCB.



## 2 Converter Efficiency

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



**V<sub>in</sub>=120V<sub>AC</sub>/50Hz**

Vin(V)	Iin(mA)	Pin(W)	Vout(V)	Iout(A)	Pout(W)	Losses(W)	Efficiency (%)
120.06	133.99	6.708	20.87	0.2508	5.234196	1.473804	78.03%
120.06	108.8	5.334	20.85	0.2007	4.184595	1.149405	78.45%
120.06	84.96	4.001	20.84	0.1508	3.142672	0.858328	78.55%
120.06	73.06	3.344	20.84	0.1257	2.619588	0.724412	78.34%
120.06	60.8	2.675	20.85	0.0999	2.082915	0.592085	77.87%
120.06	48.73	2.035	20.85	0.0749	1.561665	0.473335	76.74%
120.06	35.79	1.39	20.85	0.0499	1.040415	0.349585	74.85%
120.06	21.32	0.7315	20.89	0.02494	0.520997	0.2105034	71.22%
120.06	13.535	0.4183	20.95	0.01229	0.257476	0.1608245	61.55%
120.12	10.328	0.3226	12.59	0	0	0.3226	0.00%

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

Vin(V)	Iin(mA)	Pin(W)	Vout(V)	Iout(A)	Pout(W)	Losses(W)	Efficiency (%)
230.2	86.28	6.707	20.9	0.2508	5.24172	1.46528	78.15%
230.2	72.37	5.38	20.86	0.2007	4.186602	1.193398	77.82%
230.2	57.97	4.072	20.84	0.1508	3.142672	0.929328	77.18%
230.2	50.54	3.425	20.84	0.1257	2.619588	0.805412	76.48%
230.2	42.97	2.793	20.84	0.1009	2.102756	0.690244	75.29%
230.2	35.13	2.169	20.83	0.0759	1.580997	0.588003	72.89%
230.2	26.72	1.549	20.83	0.0509	1.060247	0.488753	68.45%
230.2	16.745	0.865	20.88	0.02474	0.516571	0.3484288	59.72%
230.2	11.495	0.542	20.93	0.01231	0.257648	0.2843517	47.54%
230.2	2.761	0.08886	20.89	0	0	0.08886	0.00%

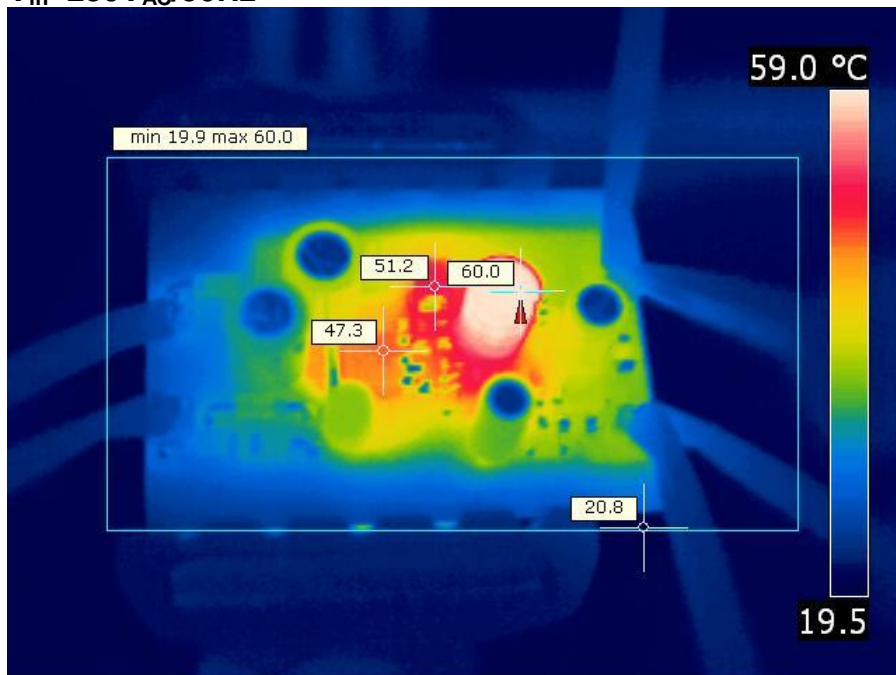
### 3 Thermal Images

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 20V/0.25A.

**V<sub>in</sub>=120V<sub>AC</sub>/50Hz**



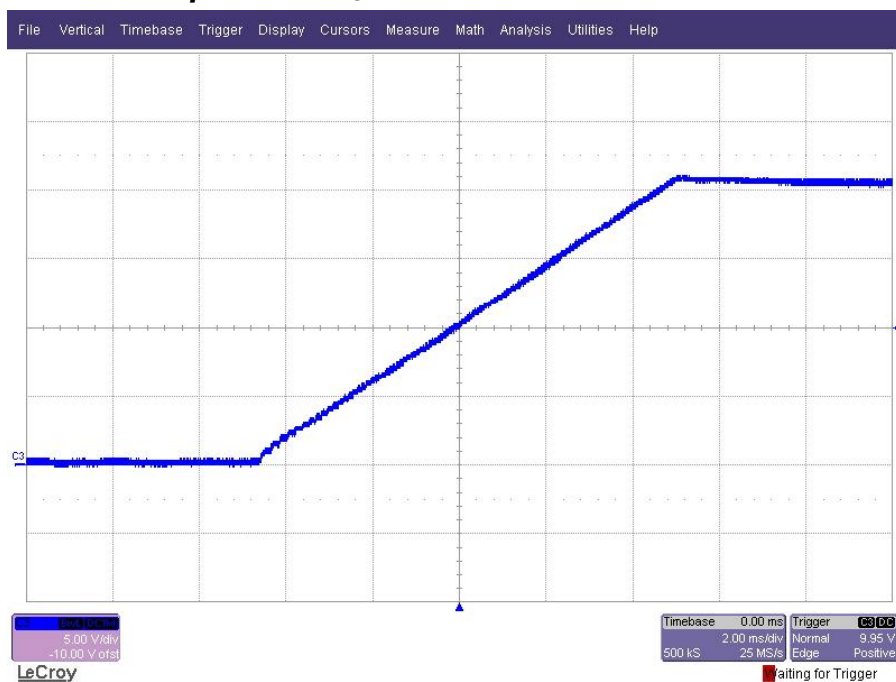
**V<sub>in</sub>=230V<sub>AC</sub>/50Hz**



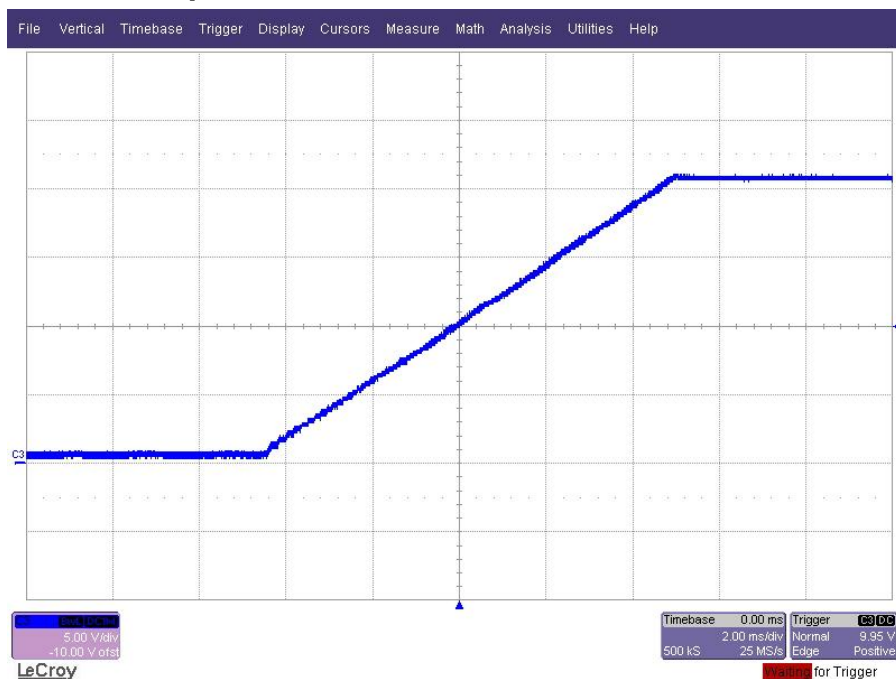
## 4 Startup Waveforms

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

### 4.1 Start Up @ 120V<sub>AC</sub>: 20V/0.25A.

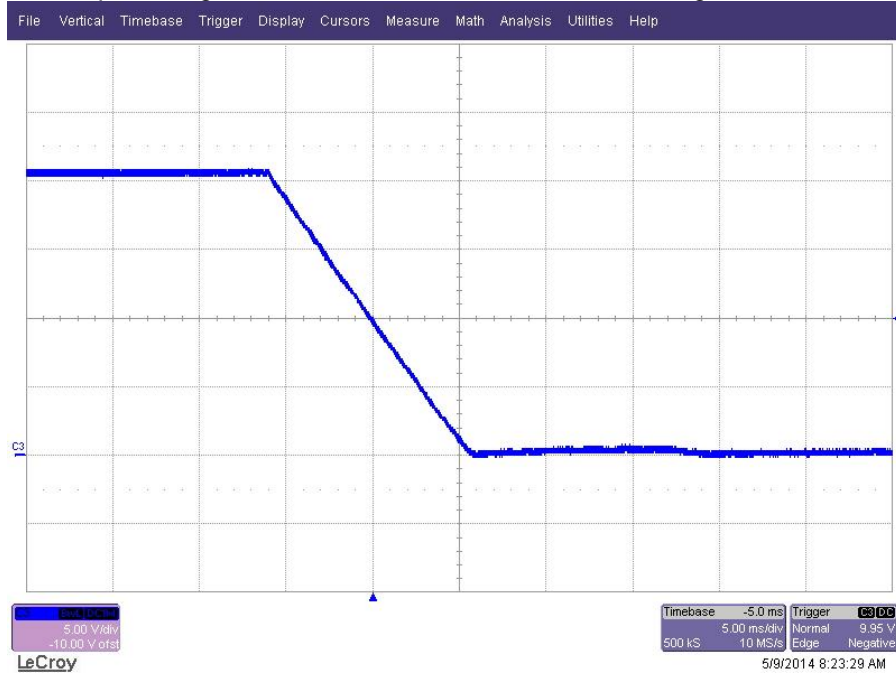


### 4.2 Start Up @ 120V<sub>AC</sub>: no load.



## 5 Turn off

The output voltage at turn off transient is shown in the image below at 20V/0.25A and 120V<sub>AC</sub>/60Hz input.



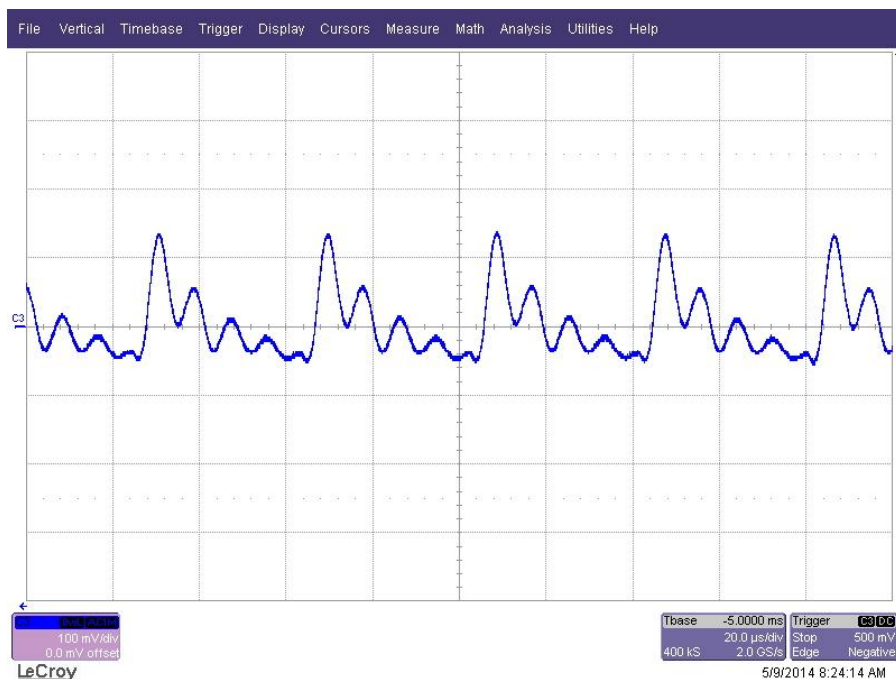


## 6 Output Ripple Voltages

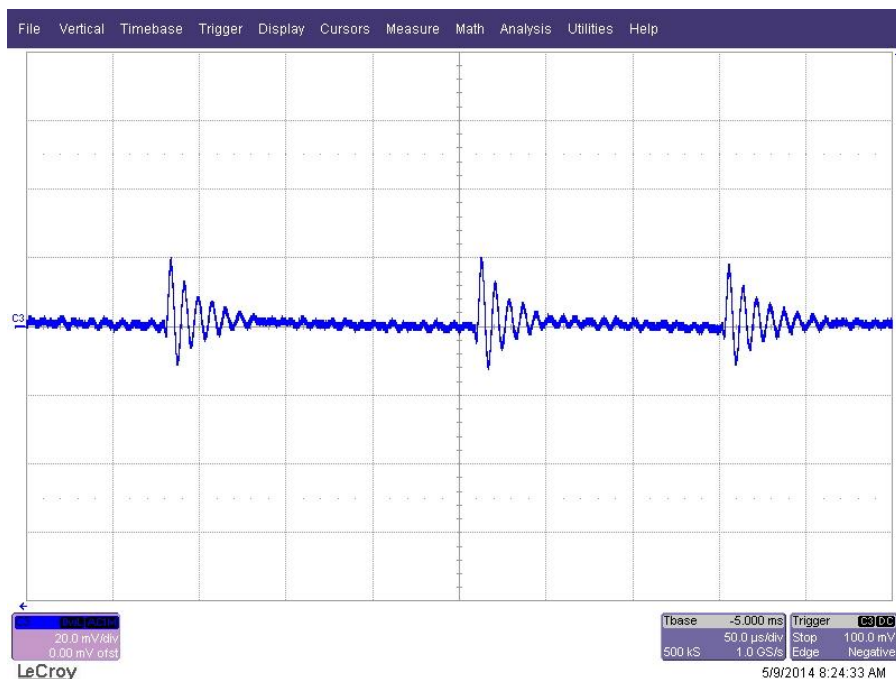
The output ripple voltages are shown in the plots below:

### 6.1 120V<sub>AC</sub>/60Hz

#### 6.1.1 20V/0.25A

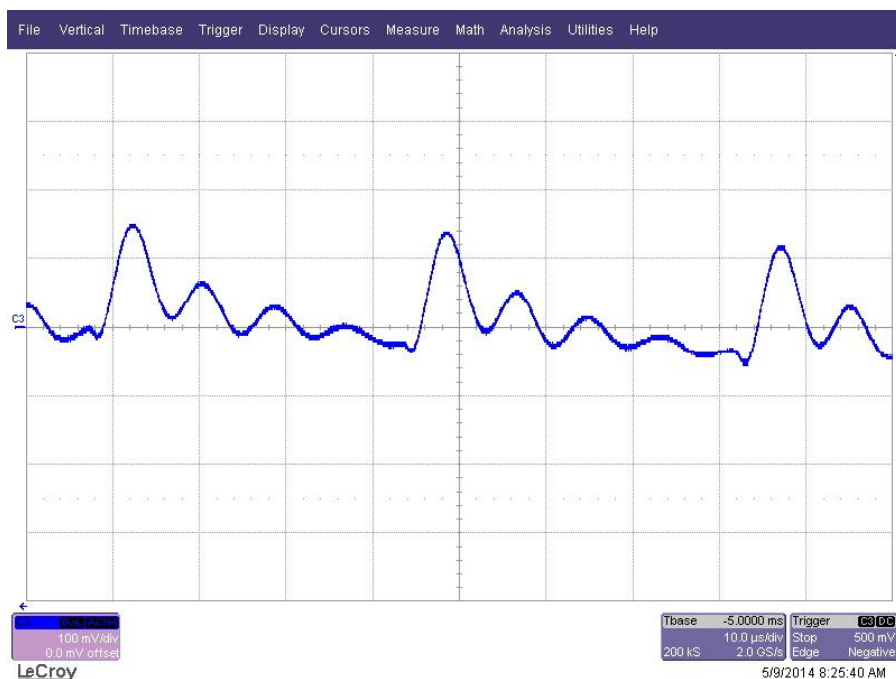


#### 6.1.2 No load

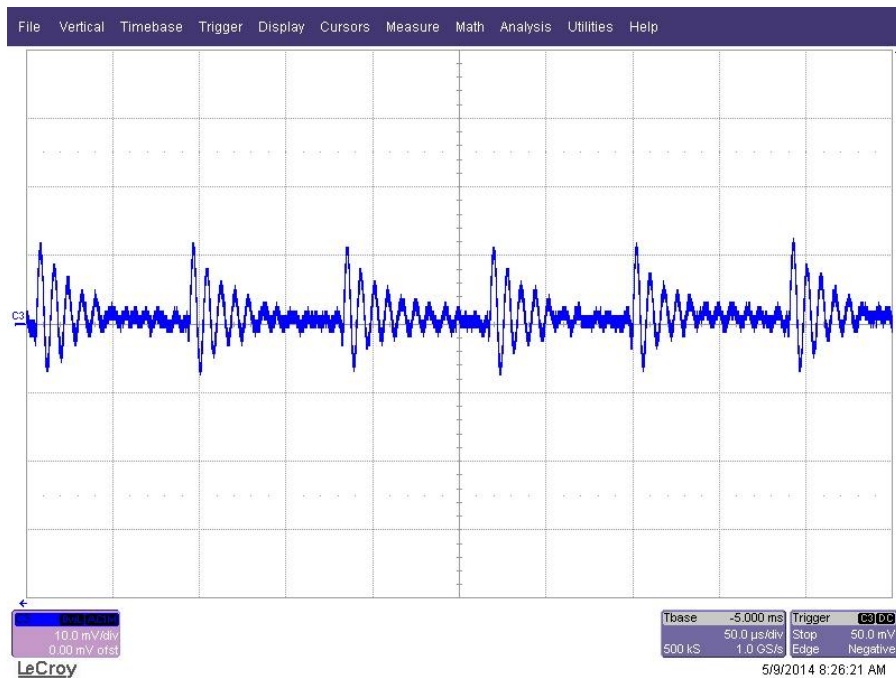


## 6.2 230V<sub>AC</sub>/50Hz

### 6.2.1 20V/0.25A



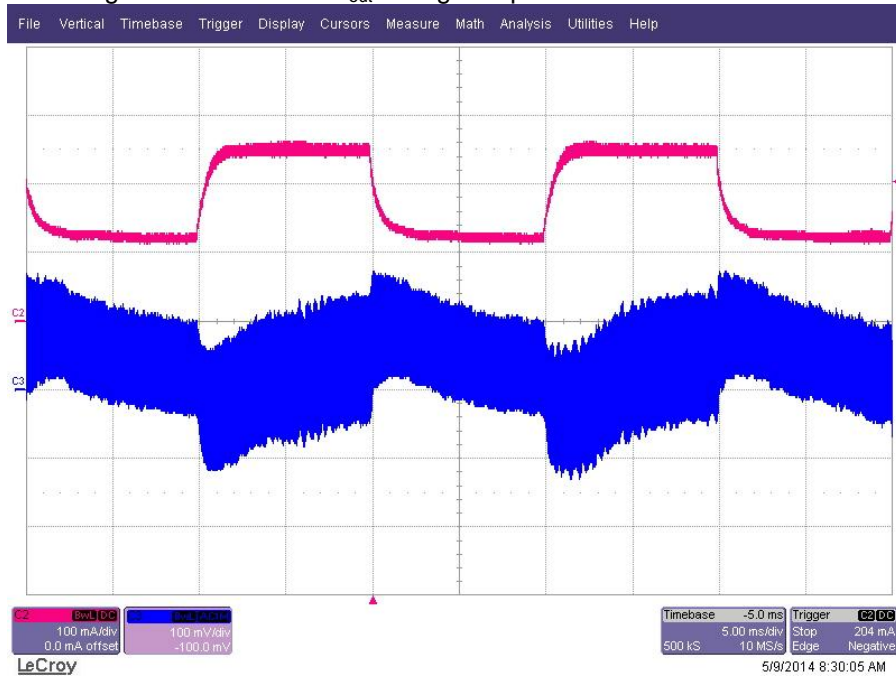
### 6.2.2 No load





## 7 Load Transient

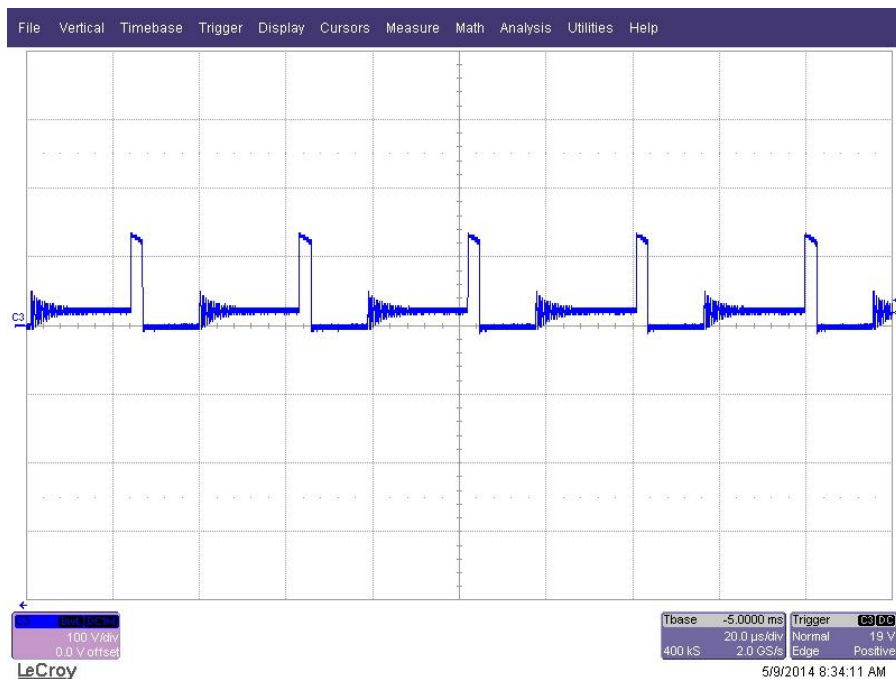
The image below shows  $20V_{out}$  voltage response to a **0.12A** to **0.25A** load transient at  $120V_{AC}/60\text{Hz}$  input.



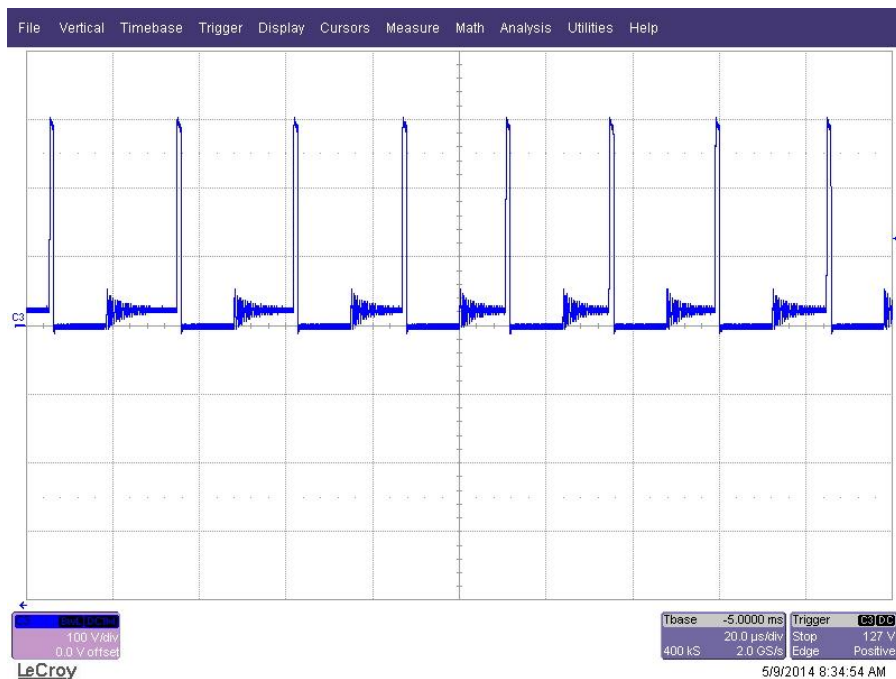
## 8 Switching Waveforms

The images below show key switching waveforms of PMP9649RevA. The waveforms are measured with 0.25A load current.

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



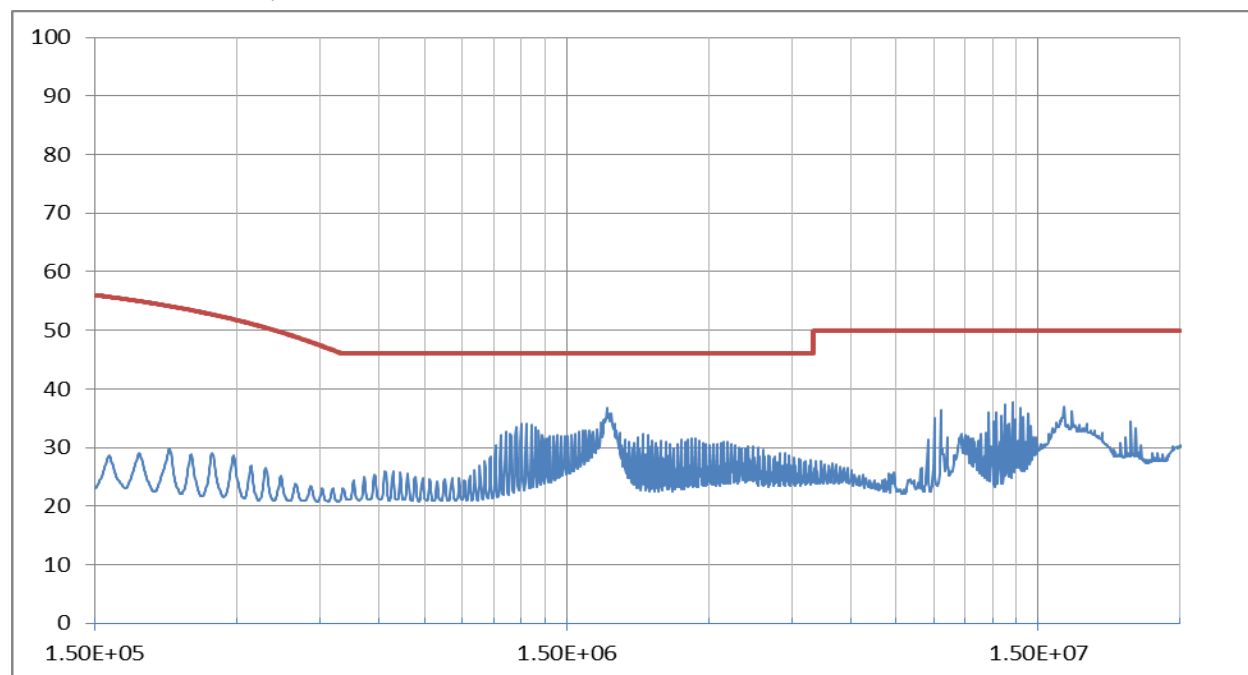
### 8.2 Diode D4 @ 230V<sub>AC</sub>/50Hz



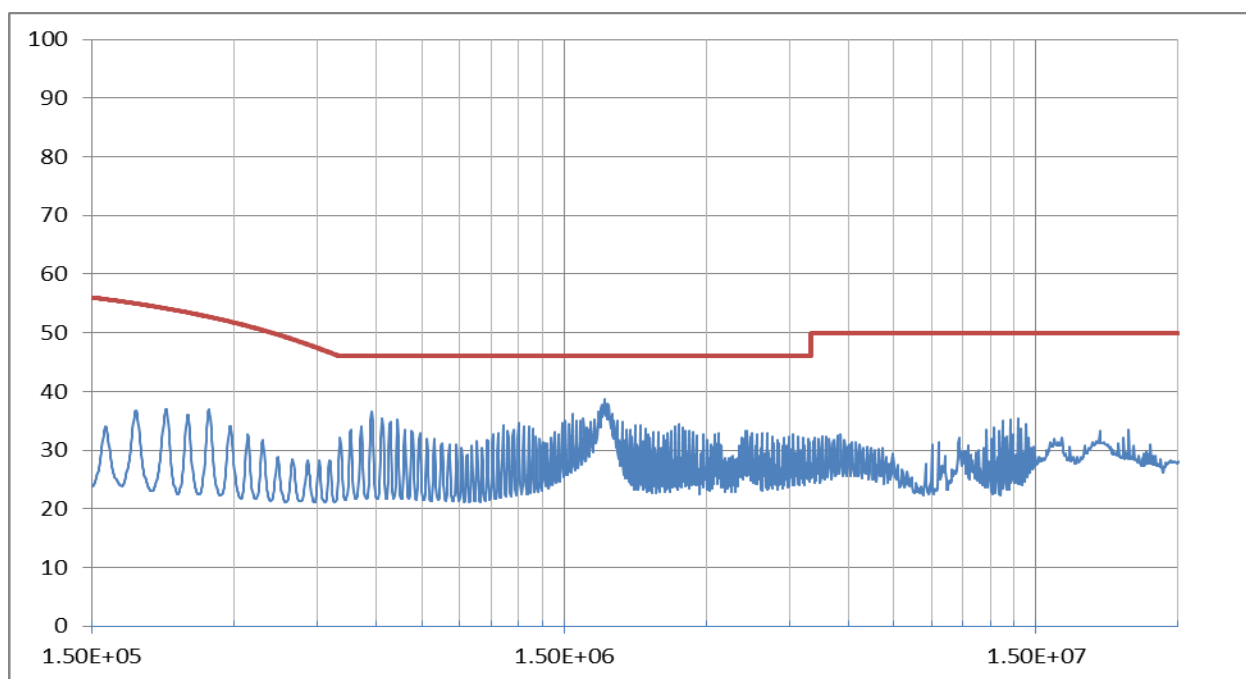
## 9 Conducted EMI:

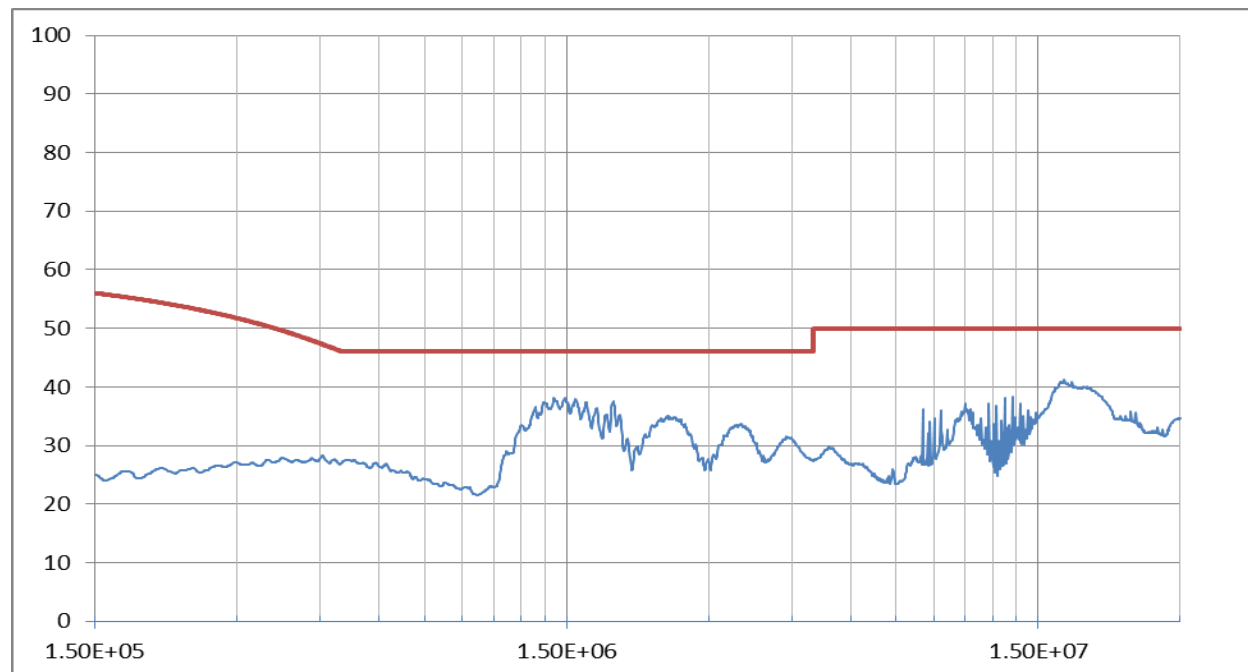
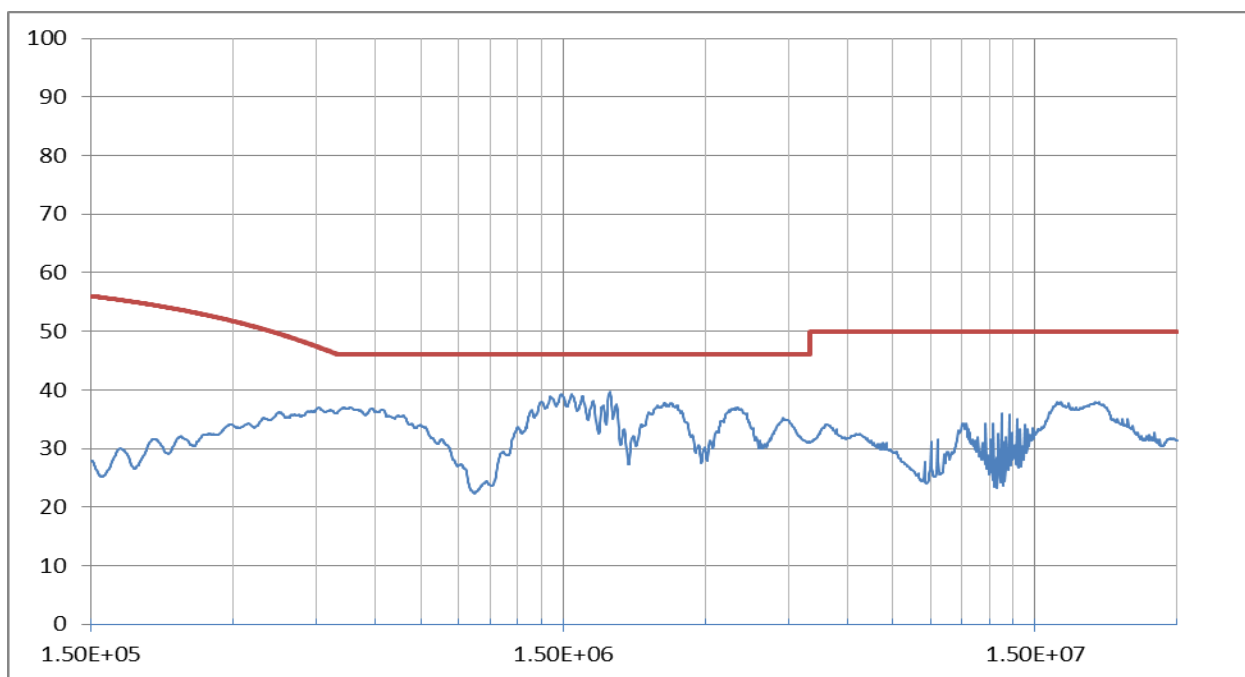
Conducted EMI of PMP9649 Rev A was tested with 20V/0.2A load. The following curves show the average scan results. PMP9649 Rev A is not connected to Earth ground during the test. The board is supplied by California Instruments 1251P with an isolated transformer.

### 9.1 120V<sub>AC</sub>/60Hz, Neutral



### 9.2 120V<sub>AC</sub>/60Hz, Line



**9.3 220V<sub>AC</sub>/50Hz, Neutral****9.4 220V<sub>AC</sub>/50Hz, Line**

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