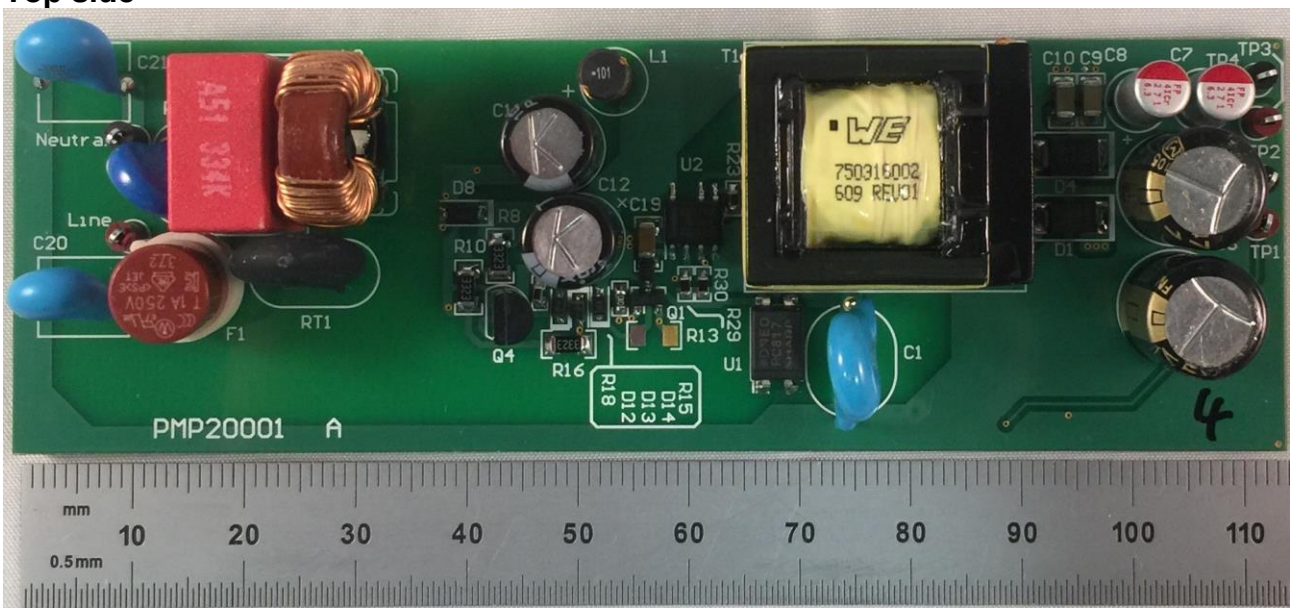
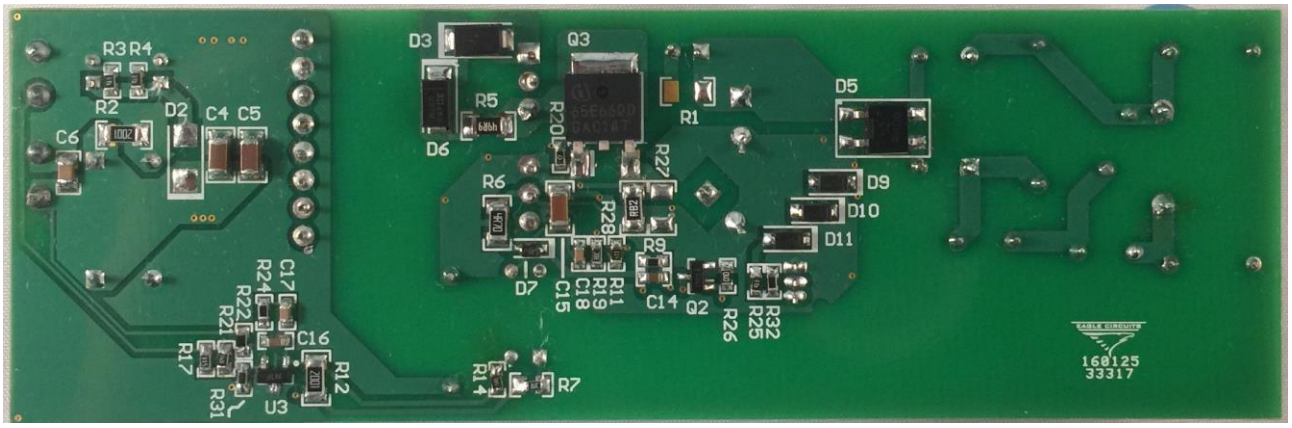
1 Photo

The photographs below show the PMP20001 Rev A assembly. This circuit was built on a PMP20001 Rev A PCB.

Top side



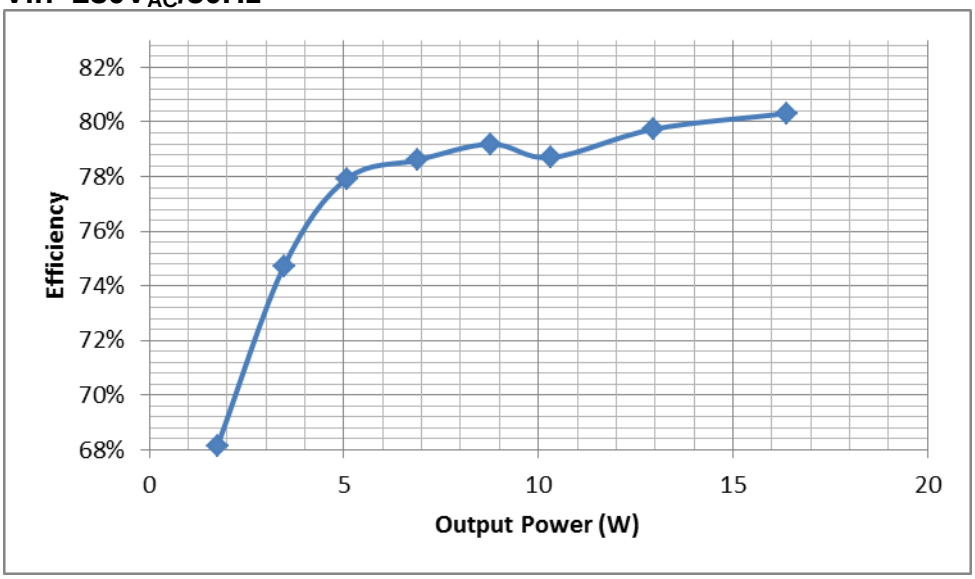
Bottom side



2 Converter Efficiency

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

Vin=230V_{AC}/50Hz



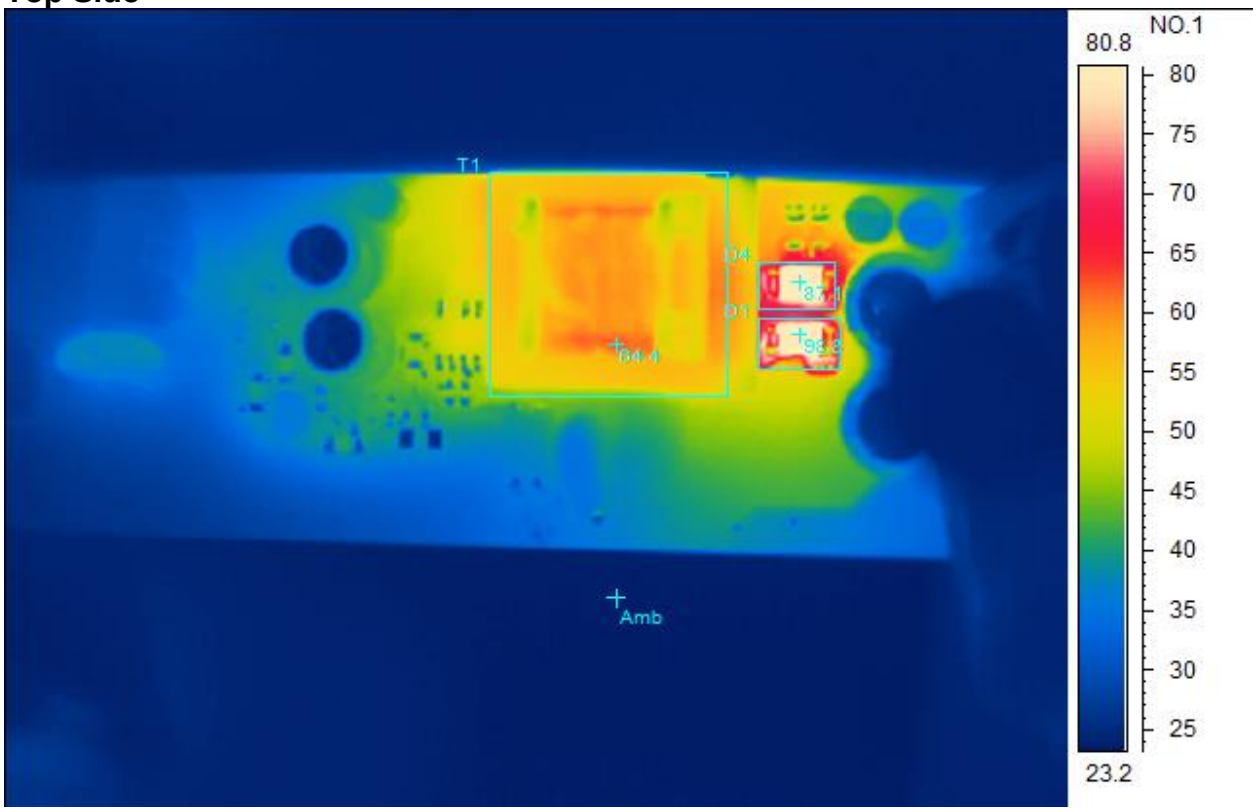
Vin(AC)	Iin(A)	Pin(W)	Vo1(V)	Io1(A)	Vo2(V)	Io2(A)	Pout(W)	Eff. (%)
230	0.175	20.4	12.29	0.93	5.071	0.977	16.38407	80.31%
230	0.145	16.26	12.32	0.72	5.069	0.808	12.96615	79.74%
230	0.123	13.13	12.25	0.59	5.075	0.612	10.3334	78.70%
230	0.107	11.09	12.16	0.52	5.082	0.484	8.782888	79.20%
230	0.0898	8.79	12.14	0.4	5.084	0.404	6.909936	78.61%
230	0.0718	6.514	12.1	0.29	5.087	0.308	5.075796	77.92%
230	0.0568	4.638	12.01	0.205	5.094	0.1971	3.466077	74.73%
230	0.0402	2.565	11.96	0.1028	5.097	0.1017	1.747853	68.14%
230	0.0266	0.38	11.95	0	5.098	0	0	0.00%

3 Thermal Images

The thermal images below show a top view and bottom view of the board. The ambient temperature was 20ºC with no forced air flow. The outputs were at 12V/0.9A and 5V/1A loads.

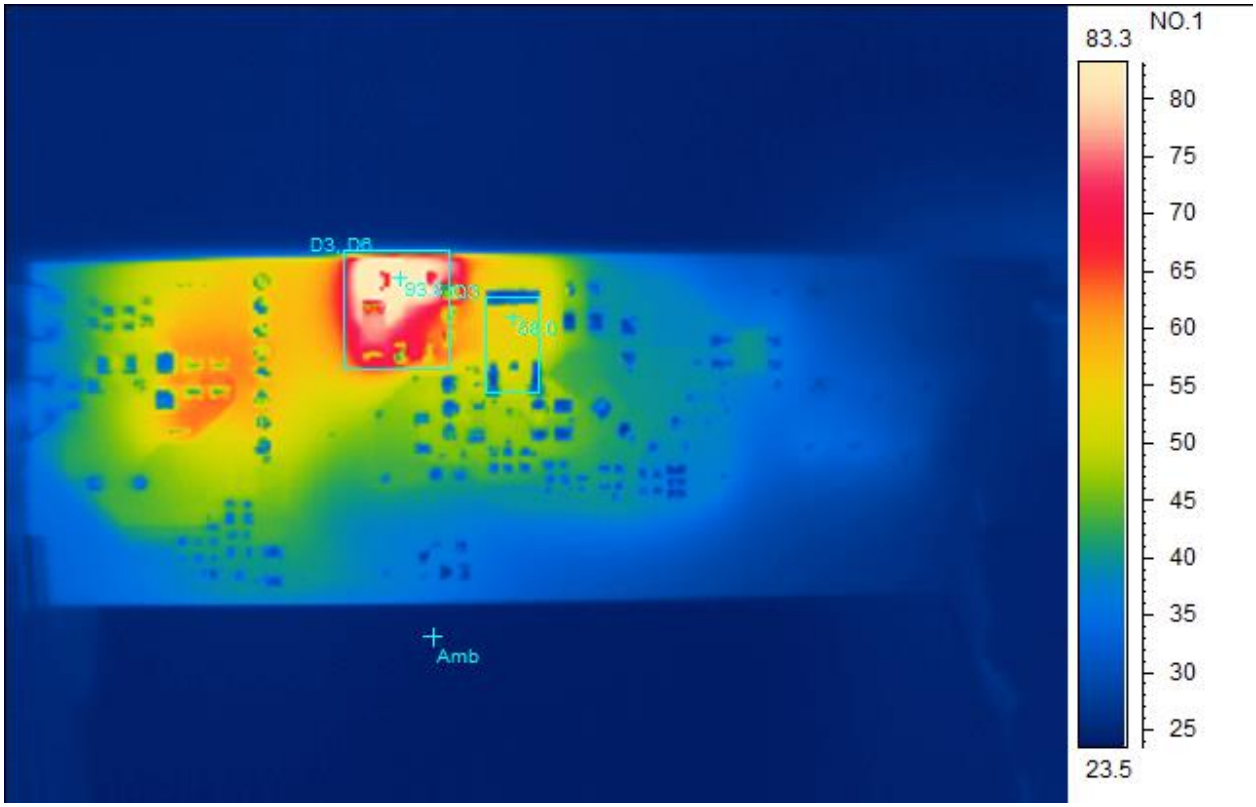
230V_{AC}/50Hz

Top Side



Spot analysis	Value
Amb Temperature	23.9°C
Area analysis	**Value**
T1Max	64.4°C
D4Max	87.1°C
D1Max	98.8°C

Bottom Side

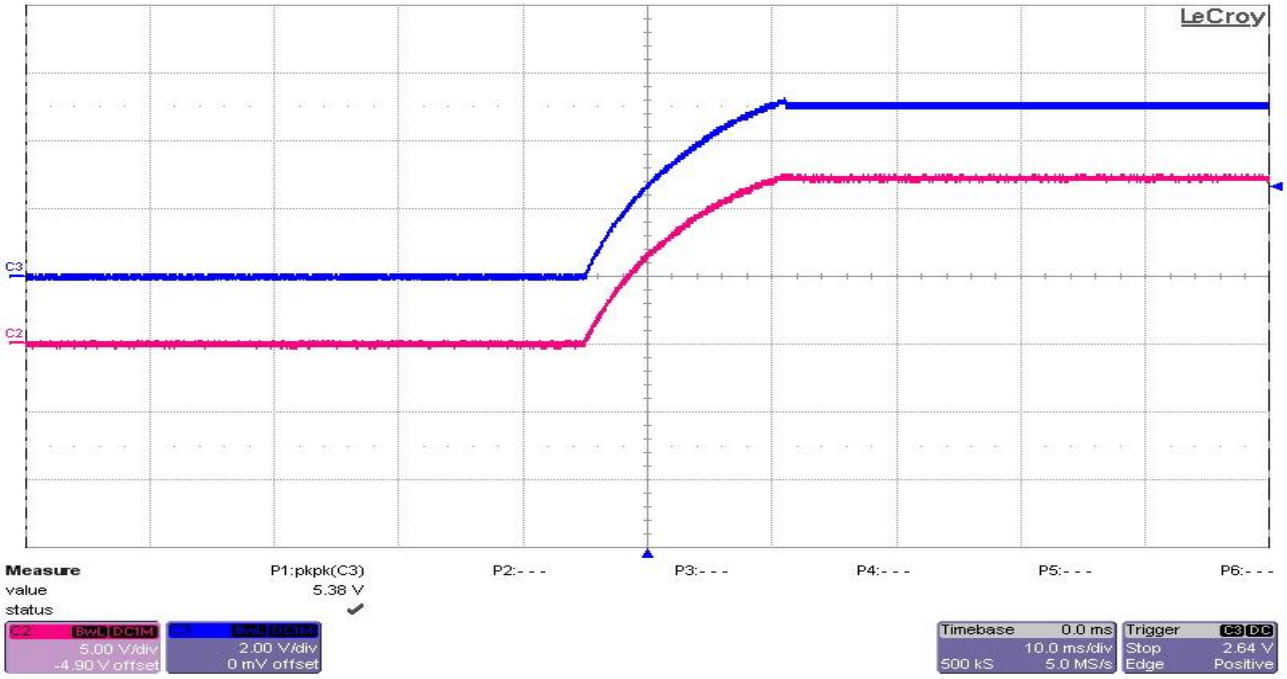


Spot analysis	Value
Amb Temperature	24.0°C
Area analysis	**Value**
D3, D6Max	93.8°C
Q3Max	58.0°C

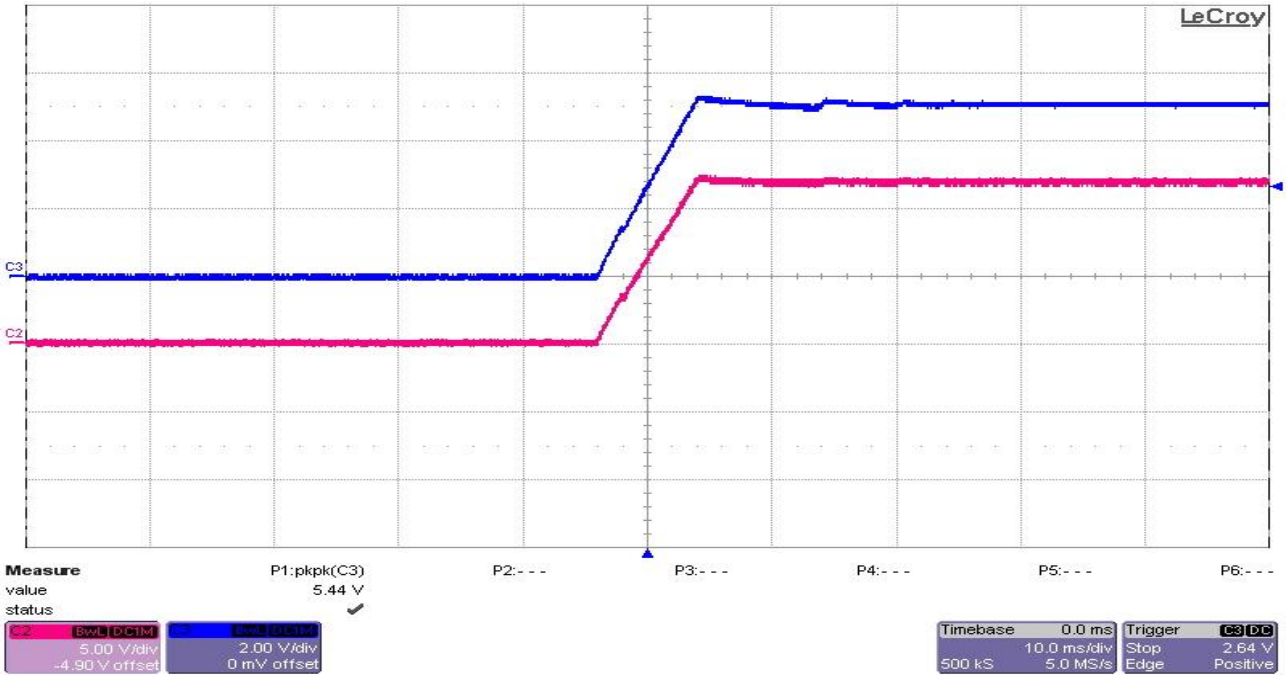
4 Startup

The output voltages during startup at 230V_{AC}/50Hz input are shown in the images below.

4.1 Start Up with 12V/0.9A, 5V/1A full load:



4.2 Start Up with no load.



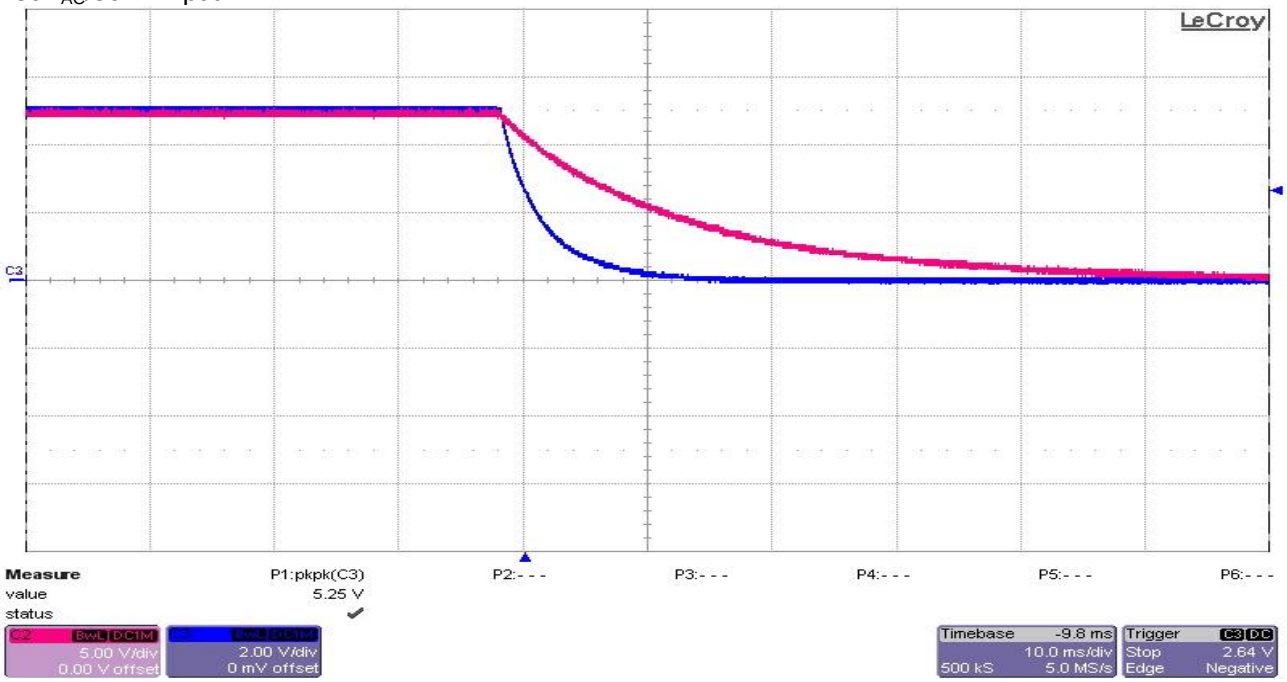
5 Cross regulation

Output voltage cross regulation is tested at $230V_{AC}$/50Hz input.

$Iout_{12V}$ (A)	$Iout_{5V}$ (A)	$12V_{measured}$ (V)	$5V_{measured}$ (V)
0	0.944	**14.65**	**4.905**
0.1	0.968	13.15	5.011
0.9	0	**10.96**	**5.164**
0.87	0.1	11.56	5.122
0.87	0.977	12.32	5.069

6 Turn off

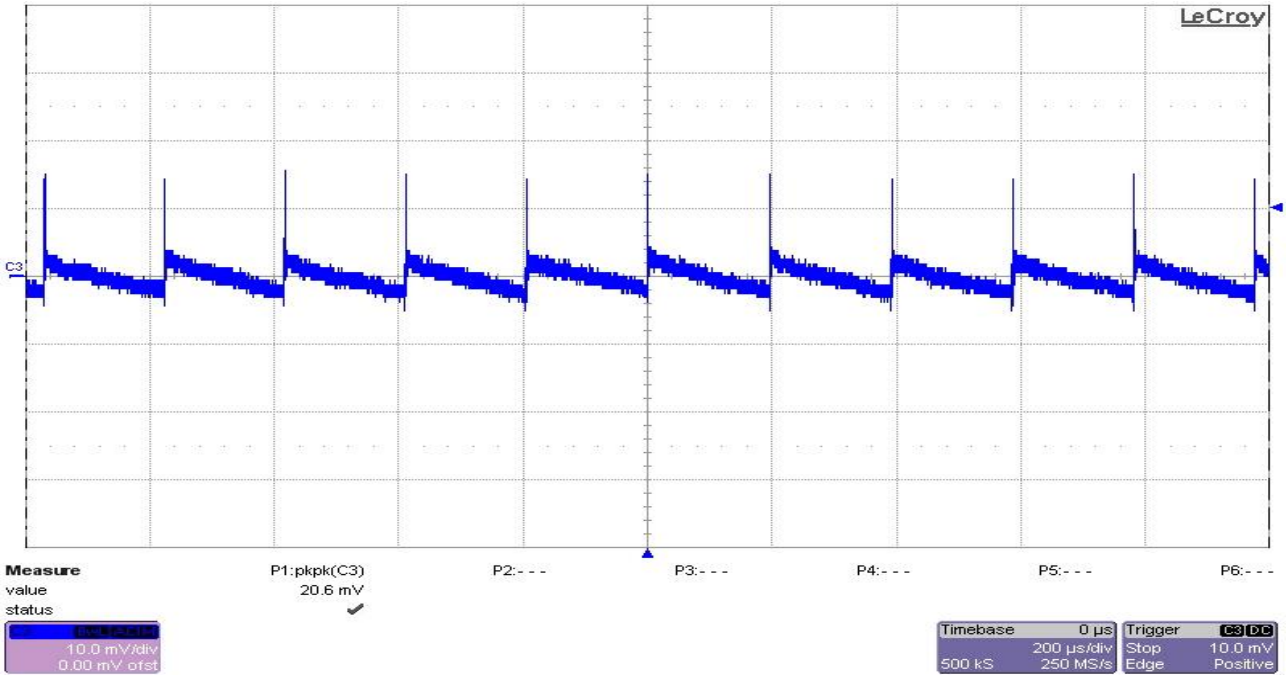
The output voltages at turn off transient are shown in the image below at full load (12V/0.9A, 5V/1A) and $230V_{AC}$/50Hz input.



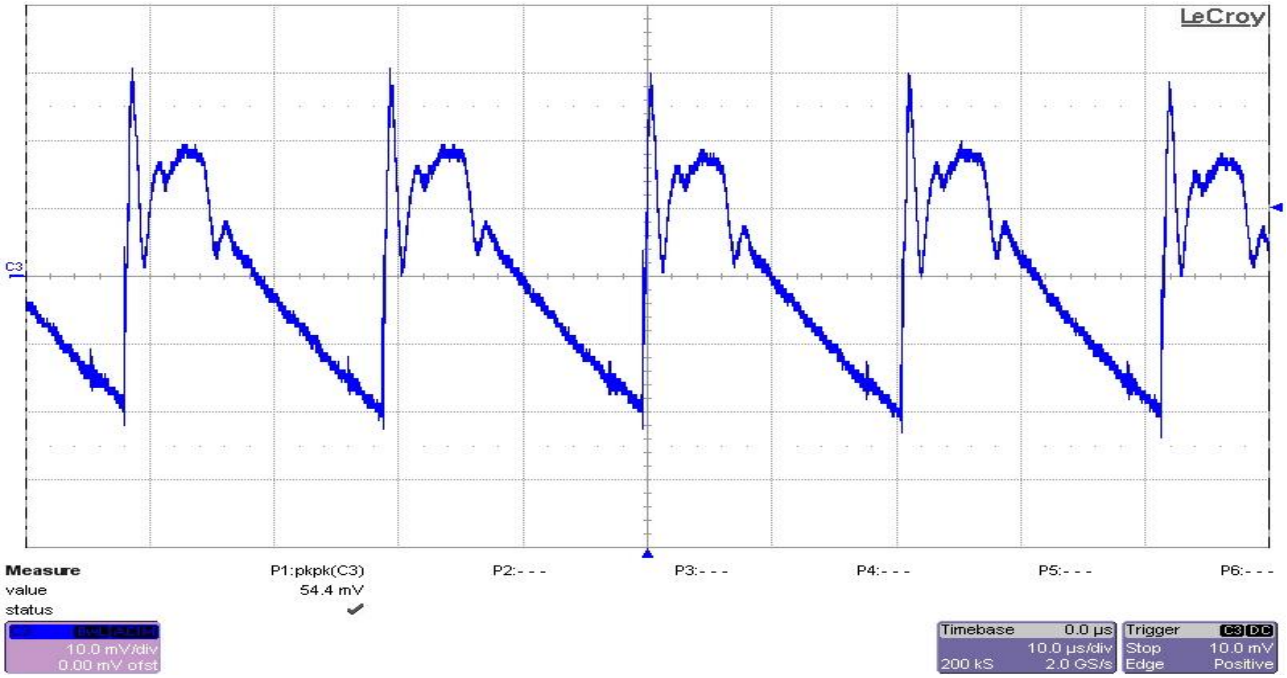
7 Output Ripple Voltages

The output ripple voltages are shown in the plots below at 230V_{AC}/50Hz.

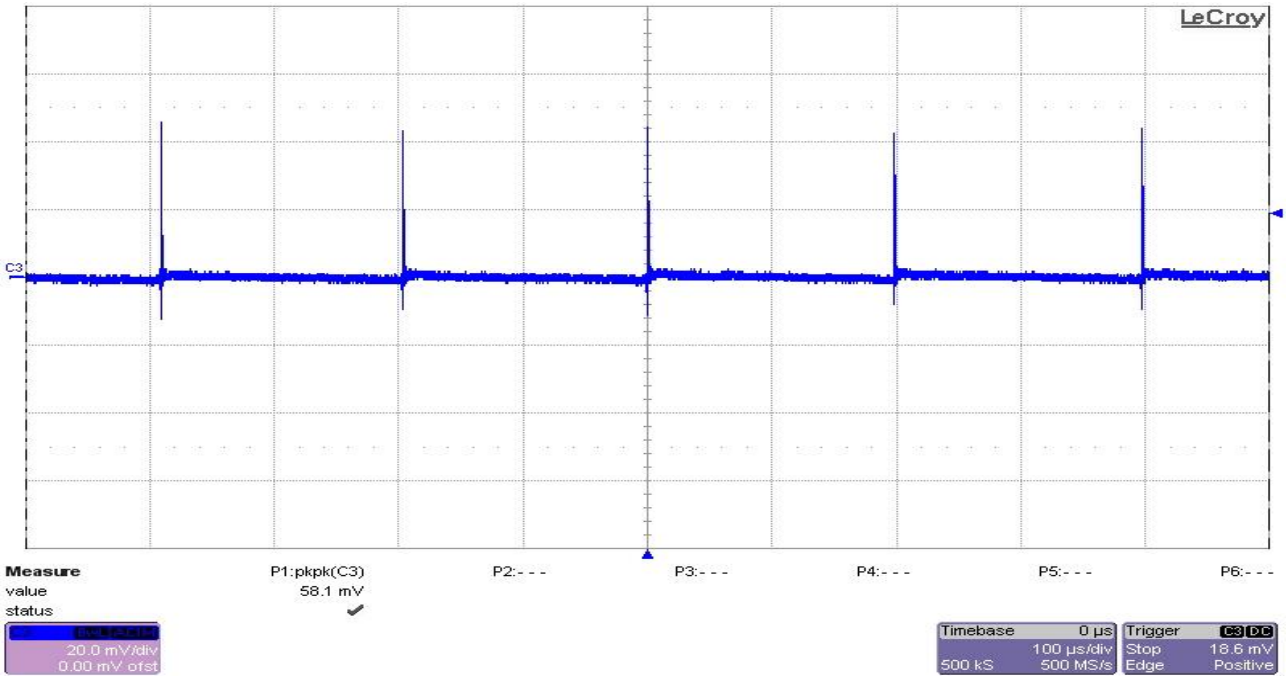
7.1 $5V_{ripple}$ with no load



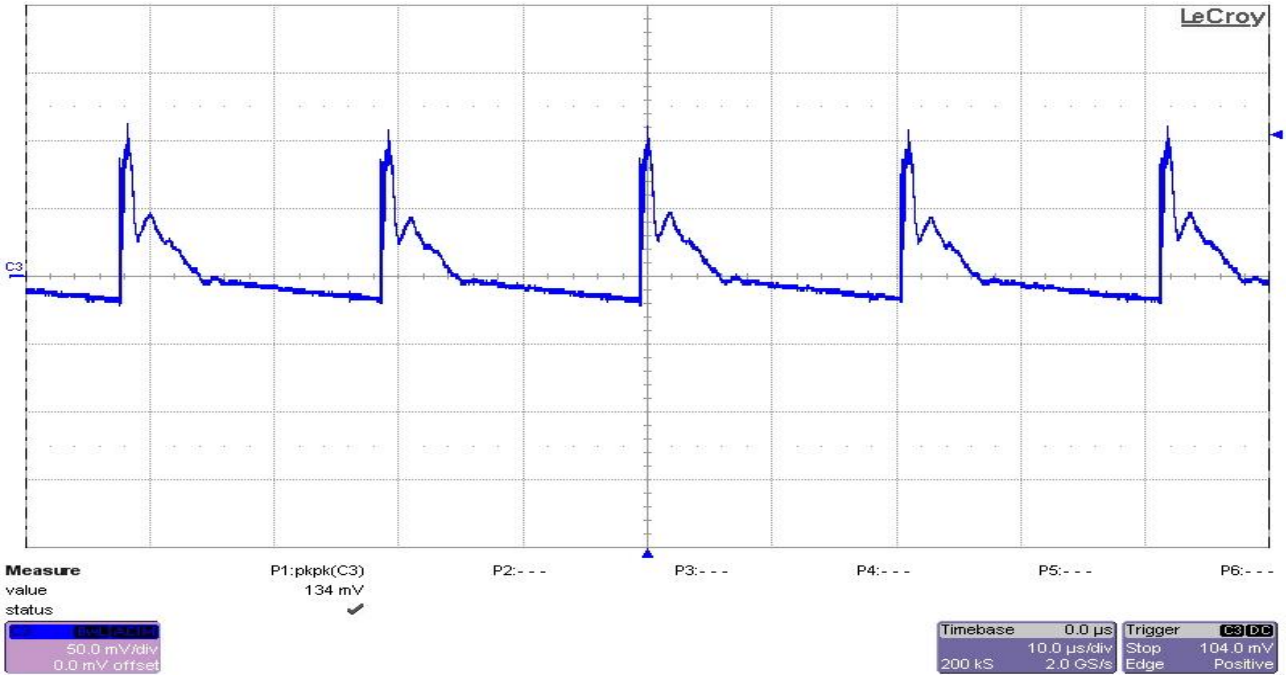
7.2 $5V_{ripple}$ with 12V/0.9A and 5V/1A full load



7.3 $12V_{ripple}$ with no load



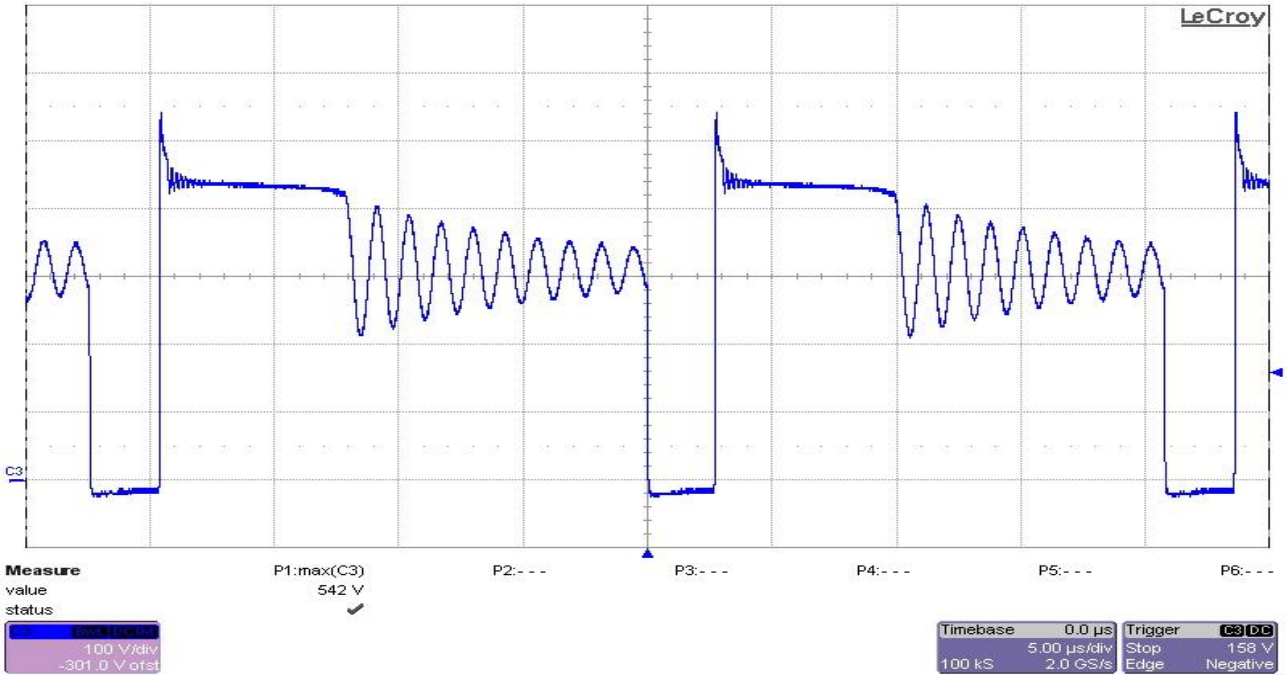
7.4 $12V_{ripple}$ with 12V/0.9A and 5V/1A full load



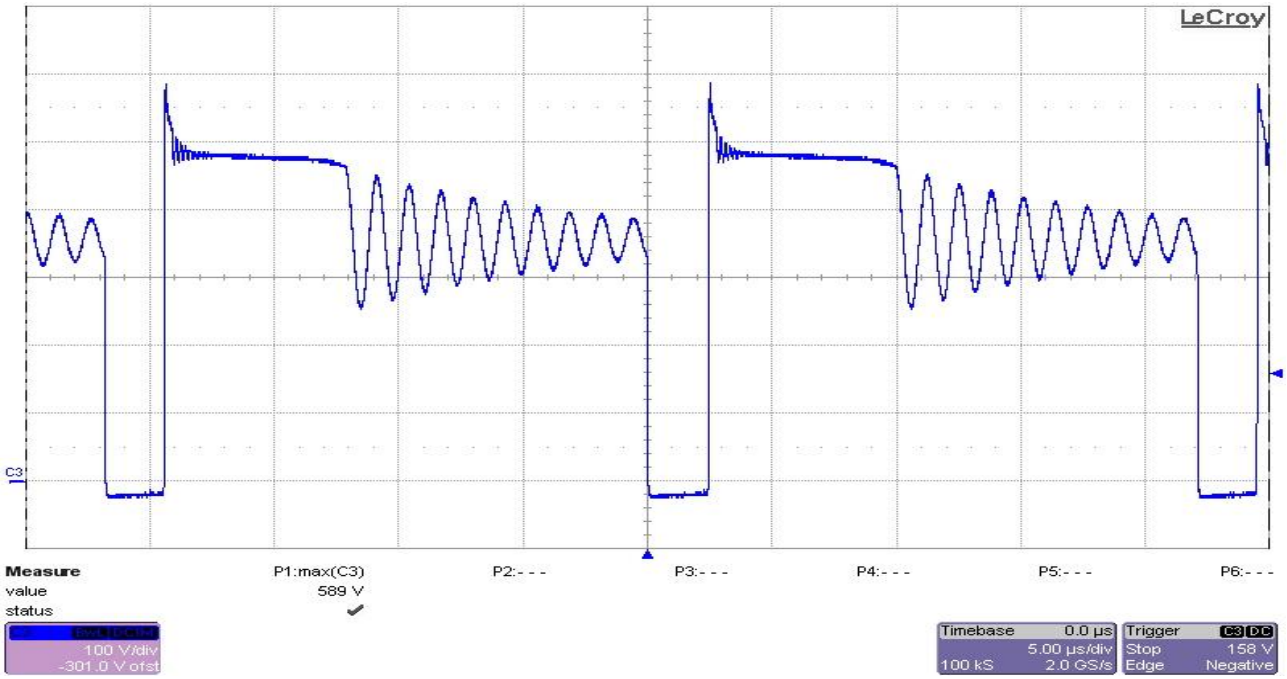
8 Switching Waveforms

The images below show key switching waveforms of PMP20001RevA. The waveforms are measured with 12V/0.9A and 5V/1A full load.

8.1 Primary MOSFET Q3 @ 230V_{AC}/50Hz

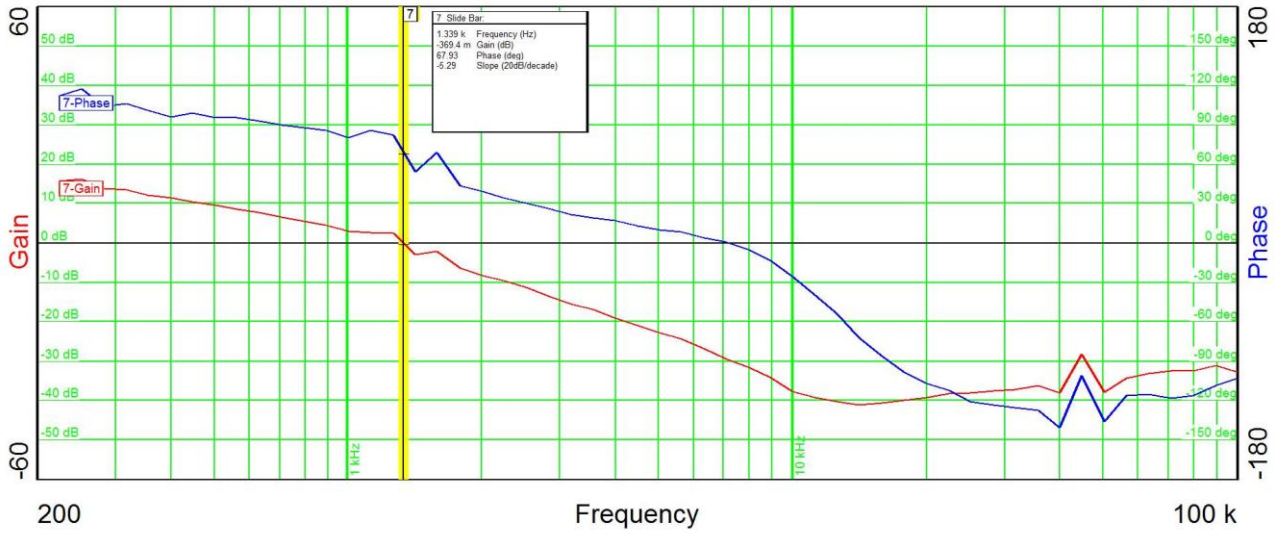


8.2 Primary MOSFET Q3 @ 260V_{AC}/50Hz



9 Frequency Response

The images below show the frequency response of PMP20001RevA with 12V/0.9A and 5V/1A loads at 230V_{AC}/50Hz.



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