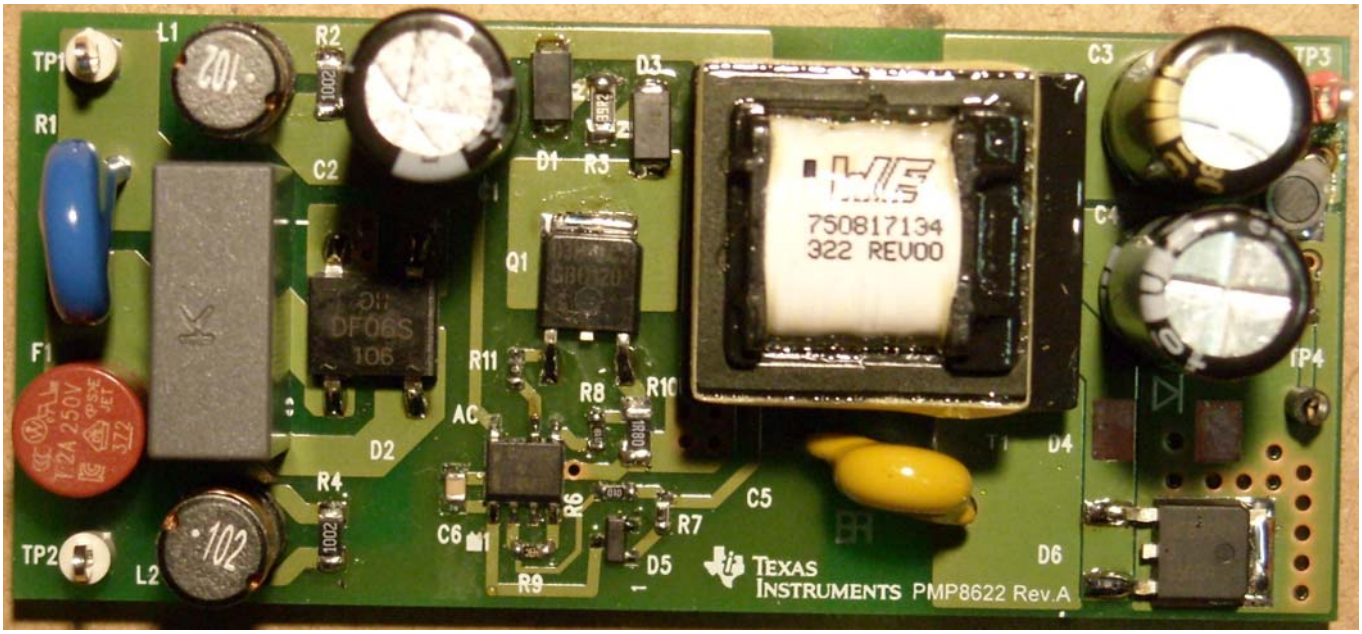
PICTURE OF THE BOARD:

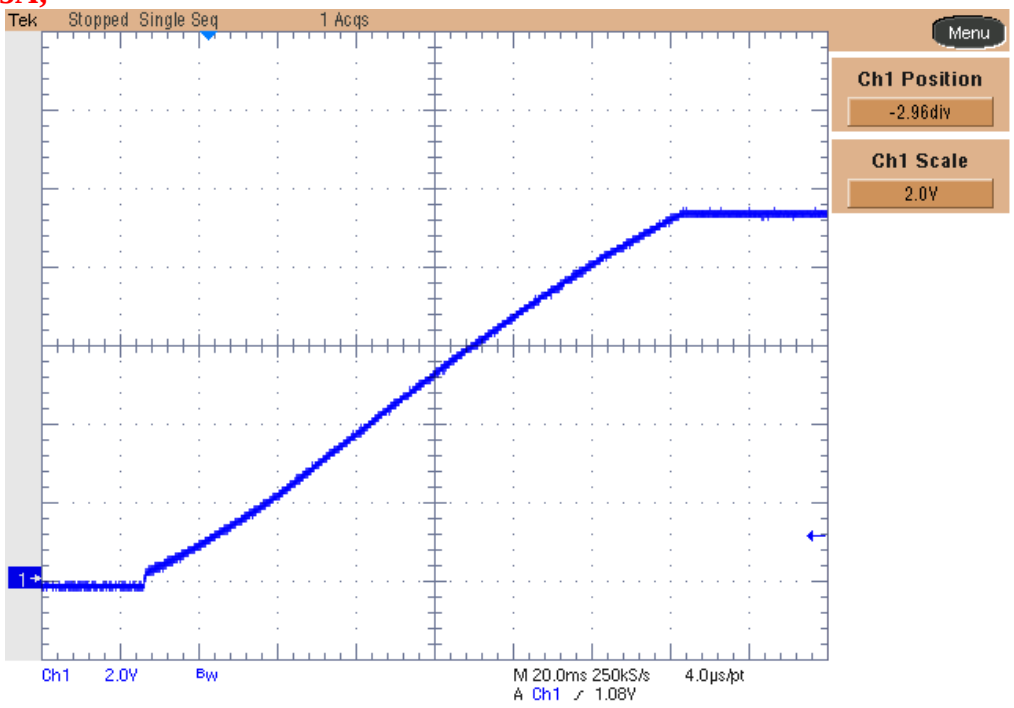


1. Startup

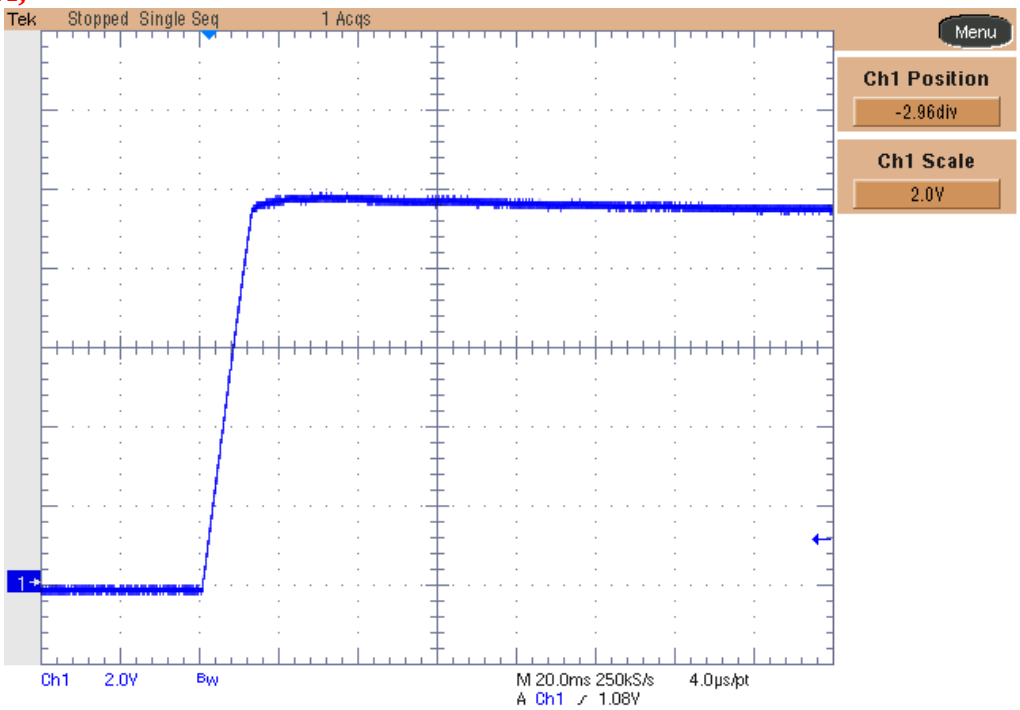
The output voltage behavior at startup is shown in the images below. The input voltage was set to 230Vac. The output fully loaded in the upper picture and unloaded for the bottom one.

Ch.1: Output voltage (2V/div, 20ms/div, DC coupling, 20MHz bandwidth)

Iout = 1.5A;

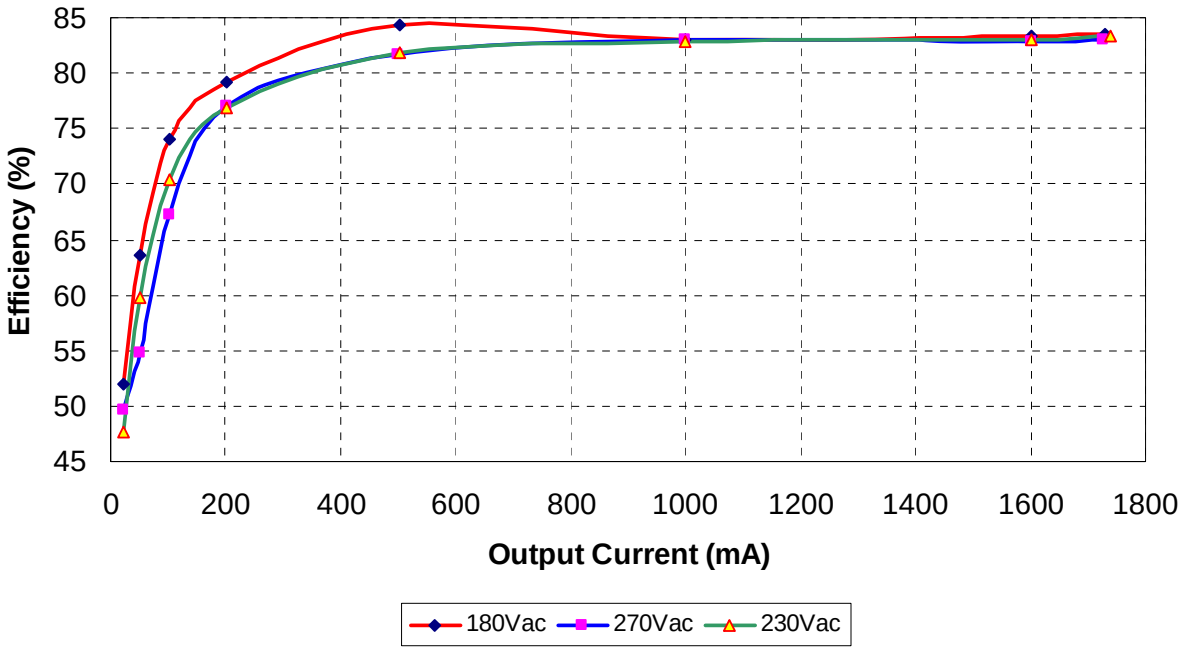


Iout = 0A;



1 Efficiency

The efficiency data are shown in the tables and graph below. A digital power meter Yokogawa WT210 has been used and the input AC voltage set to 180V, 230V and 270V rms, 50Hz.



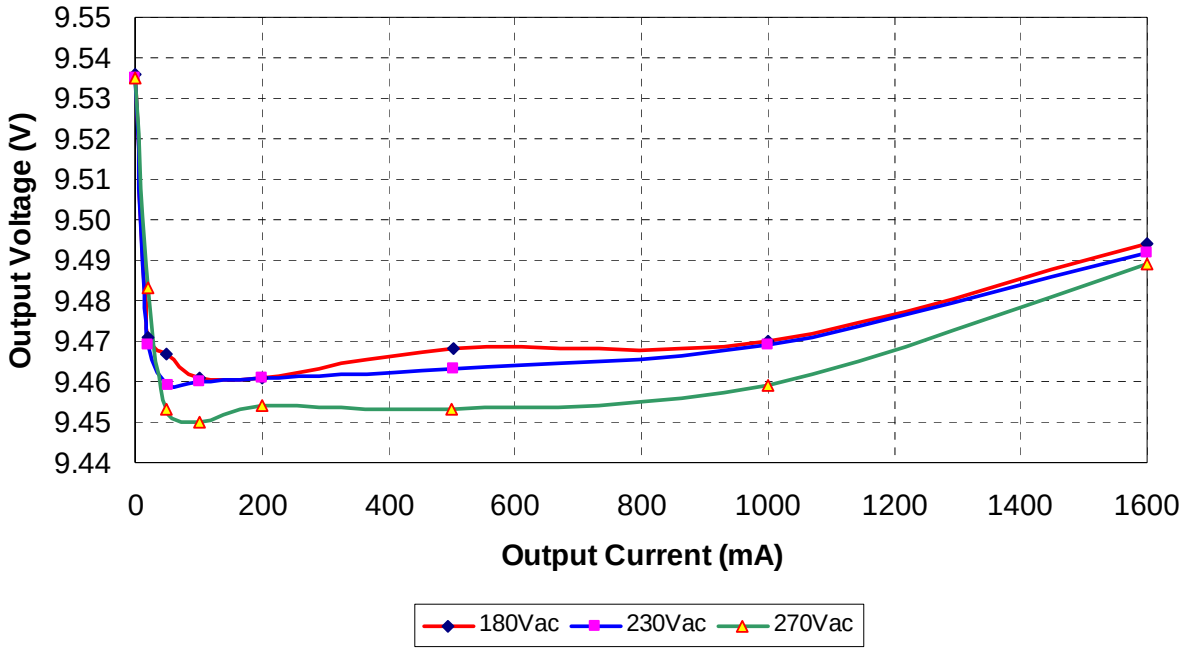
Iout (mA)	Vout (V)	Pout (W)	Pin (W)	Vin (Vac)	Ploss (W)	Eff (%)
0	9.536	0	0.023	180	0.023	0.00
21.5	9.471	0.204	0.392	180	0.188	51.95
50.9	9.467	0.482	0.758	180	0.276	63.57
101.7	9.461	0.962	1.298	180	0.336	74.13
200.4	9.461	1.896	2.392	180	0.496	79.26
502.9	9.468	4.761	5.65	180	0.889	84.27
1000.1	9.470	9.471	11.41	180	1.939	83.01
1601	9.494	15.200	18.25	180	3.050	83.29
1728	9.260	16.001	19.18	180	3.179	83.43
1751	7.453					
1767	5.063					

Iout (mA)	Vout (V)	Pout (W)	Pin (W)	Vin (Vac)	Ploss (W)	Eff (%)
0	9.535	0	0.026	230	0.026	0.00
21.5	9.469	0.204	0.427	230	0.223	47.68
51.0	9.459	0.482	0.807	230	0.325	59.78
101.7	9.460	0.962	1.368	230	0.406	70.33
200.5	9.461	1.897	2.467	230	0.570	76.89
502.9	9.463	4.759	5.81	230	1.051	81.91
1000.1	9.469	9.470	11.42	230	1.950	82.92
1600	9.492	15.187	18.28	230	3.093	83.08
1738	9.497	16.506	19.80	230	3.294	83.36
1743	9.310					
1767	7.495					
1783	4.510					

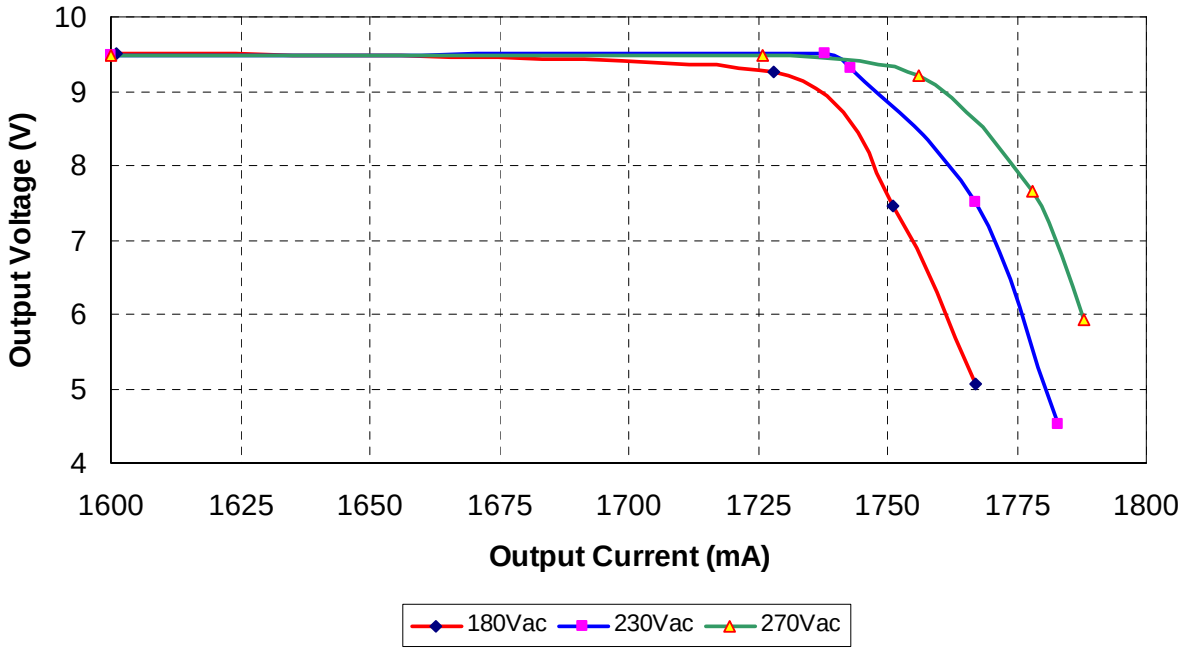
Iout (mA)	Vout (V)	Pout (W)	Pin (W)	Vin (Vac)	Ploss (W)	Eff (%)
0	9.535	0	0.032	270	0.032	0.00
21.6	9.483	0.205	0.413	270	0.208	49.60
50.9	9.453	0.481	0.878	270	0.397	54.80
101.8	9.450	0.962	1.432	270	0.470	67.18
200.5	9.454	1.896	2.463	270	0.567	76.96
500.2	9.453	4.728	5.79	270	1.062	81.66
1000.0	9.459	9.459	11.39	270	1.931	83.05
1600	9.489	15.182	18.31	270	3.128	82.92
1726	9.486	16.373	19.72	270	3.347	83.03
1756	9.220					
1778	7.666					
1788	5.925					

2 Output Voltage Regulation

The output voltage variation as function of load and input voltage is shown below:



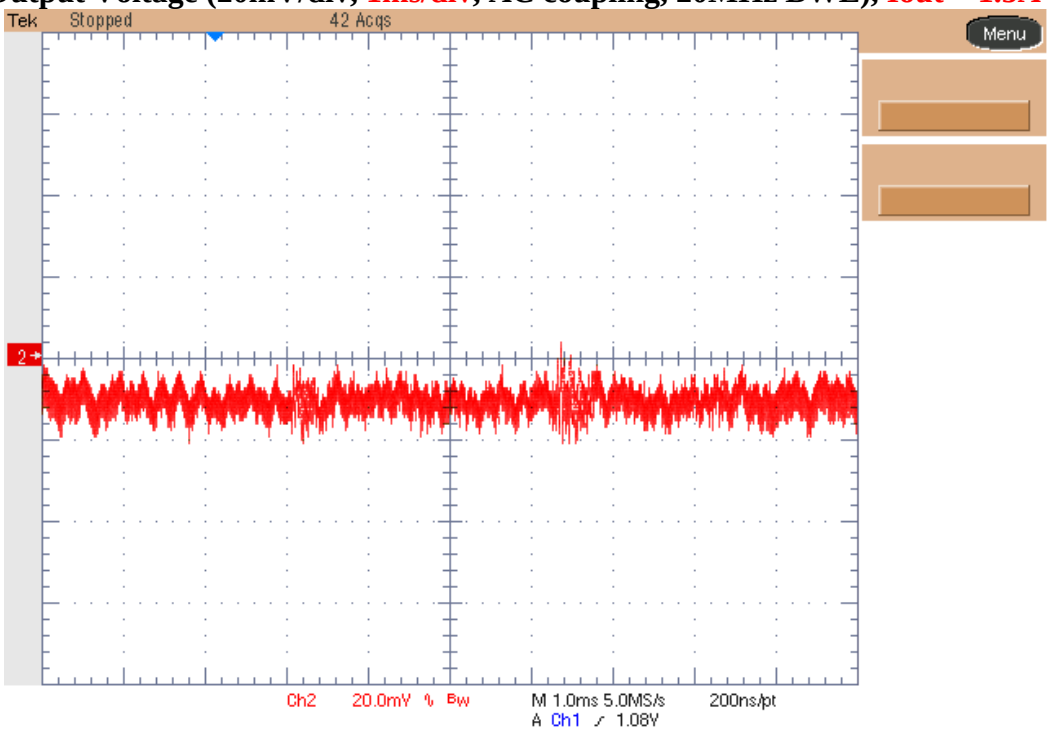
The converter has been loaded with higher current than nominal load in order to measure the current limit curve, for each input AC voltage:



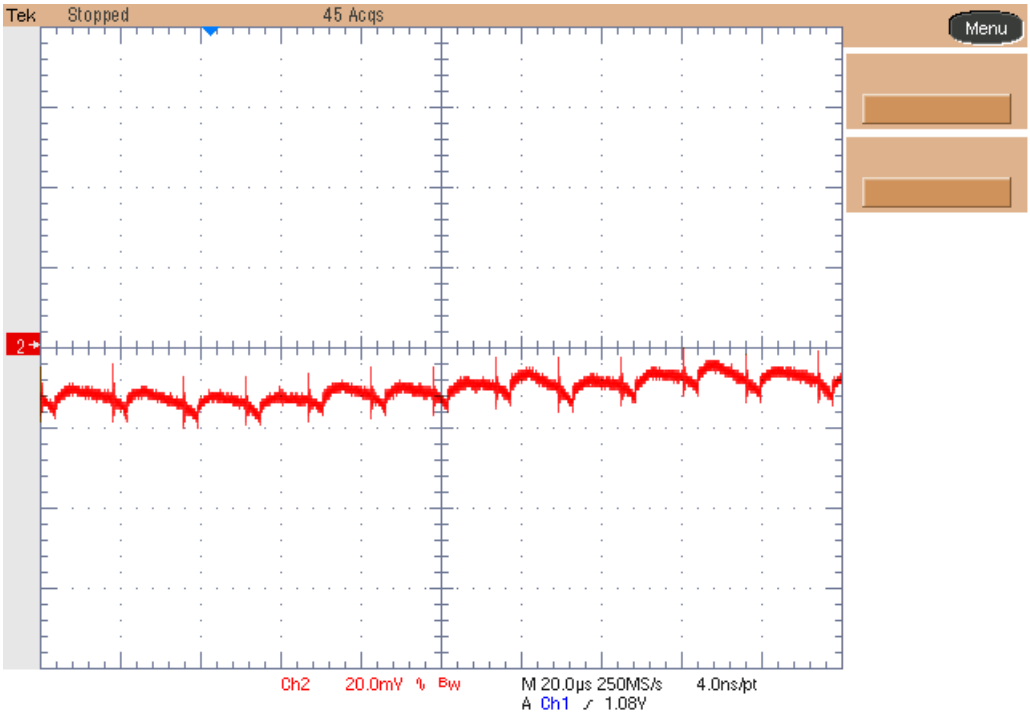
3 Output Ripple Voltage

The output ripple voltage is shown in the plots below. The input was set to 230Vac and the output fully loaded.

Ch.2: Output Voltage (20mV/div, 1ms/div, AC coupling, 20MHz BWL), Iout = 1.5A



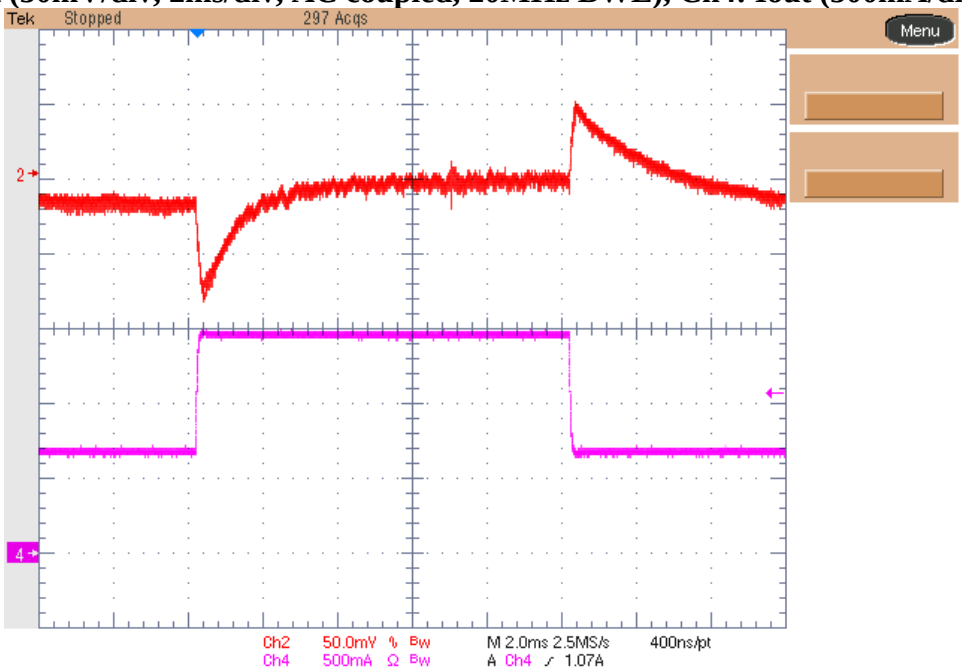
Same waveform but zoomed: time base = 20us/div.



4 Transient Response

The image below shows the transient response on the output voltage when the load has been switched between 700mA and 1.5A, at 230Vac.

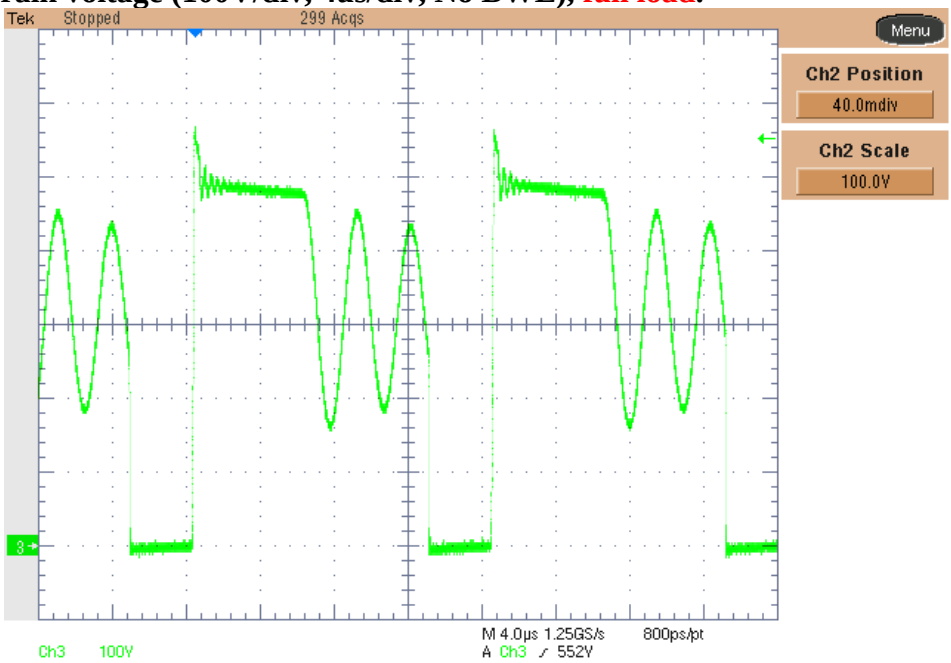
Ch2: Vout (50mV/div, 2ms/div, AC coupled, 20MHz BWL), Ch4: Iout (500mA/div)



5 Switching Node Waveform

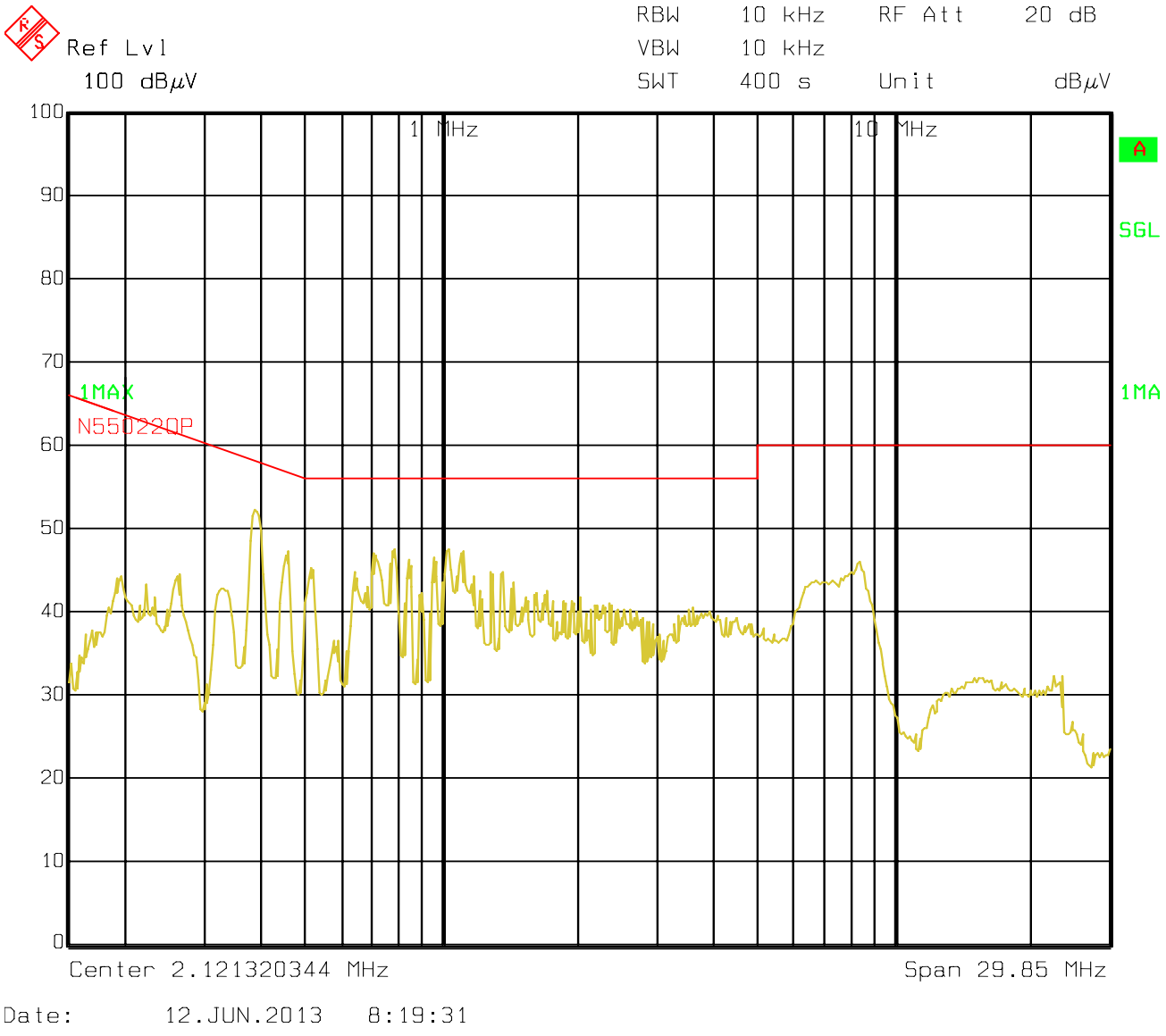
The image below shows the peak voltage on the drain of the Mosfet Q1 with a 230Vac and full load.

Ch3: Q1 Drain voltage (100V/div, 4us/div, No BWL), full load.



6 EMI measurement

The graph below shows the EMI measurement of the converter connected to an isolation transformer plus an Hameg HM6050-2 LISN. The supply voltage was 230Vac.
The converter has been loaded with a 6 Ohm power resistor. Both converter and resistor have been placed 20cm over the ground plane. The output ground terminal has been left floating.



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