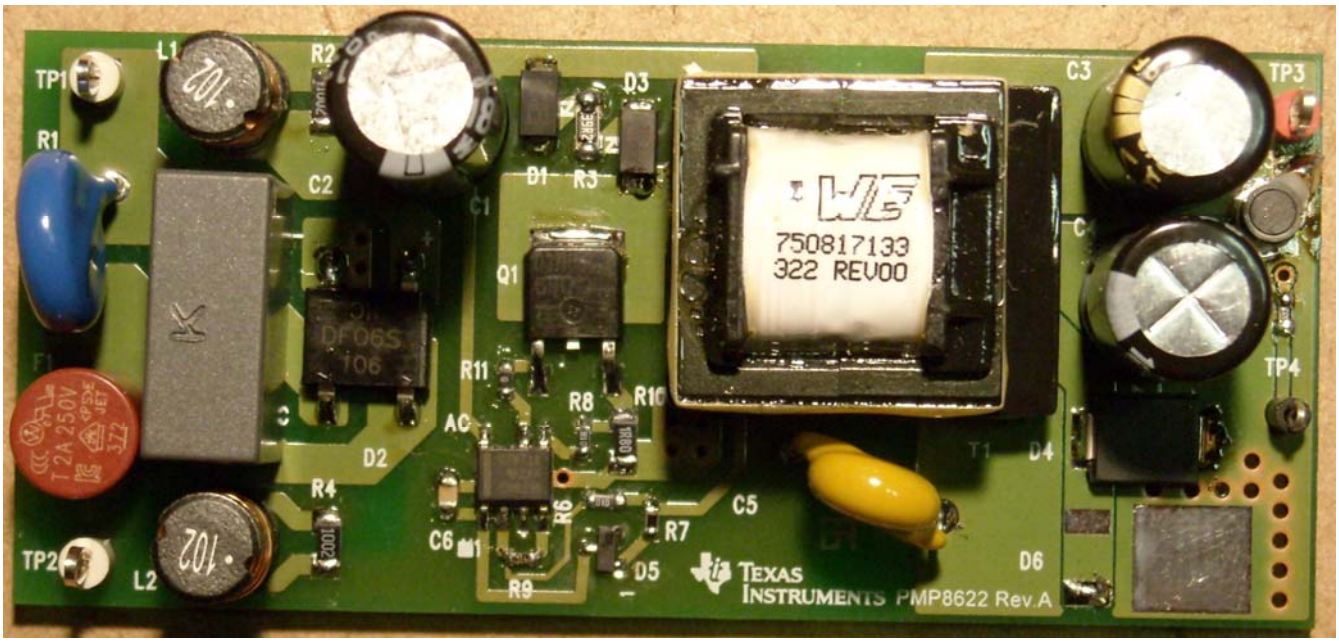
PICTURE OF THE BOARD:

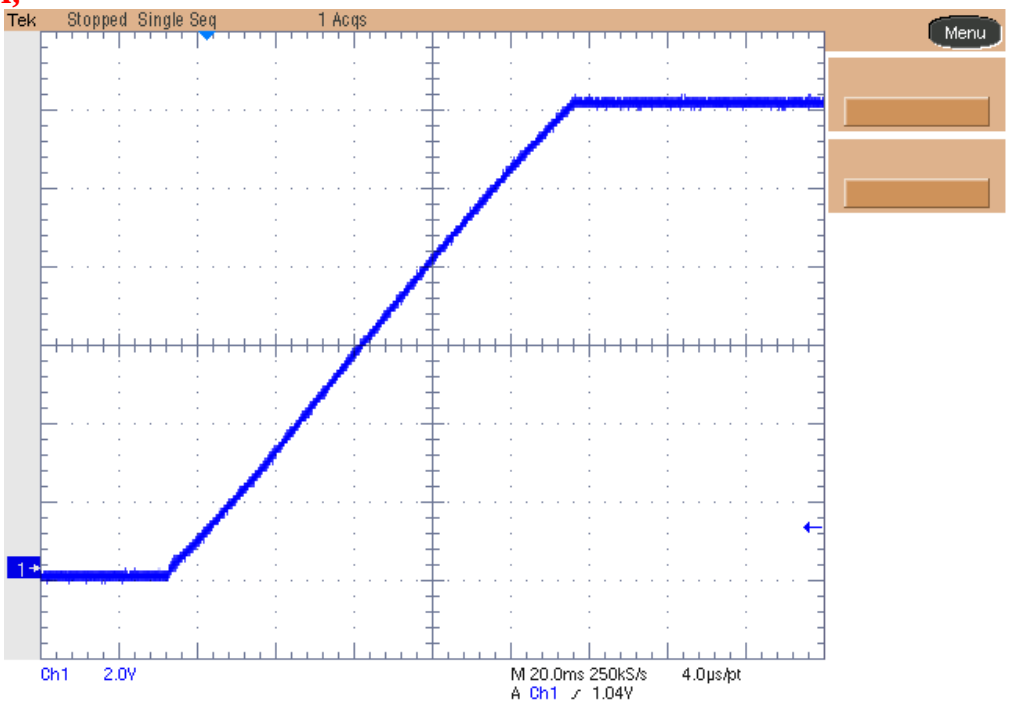


1. Startup

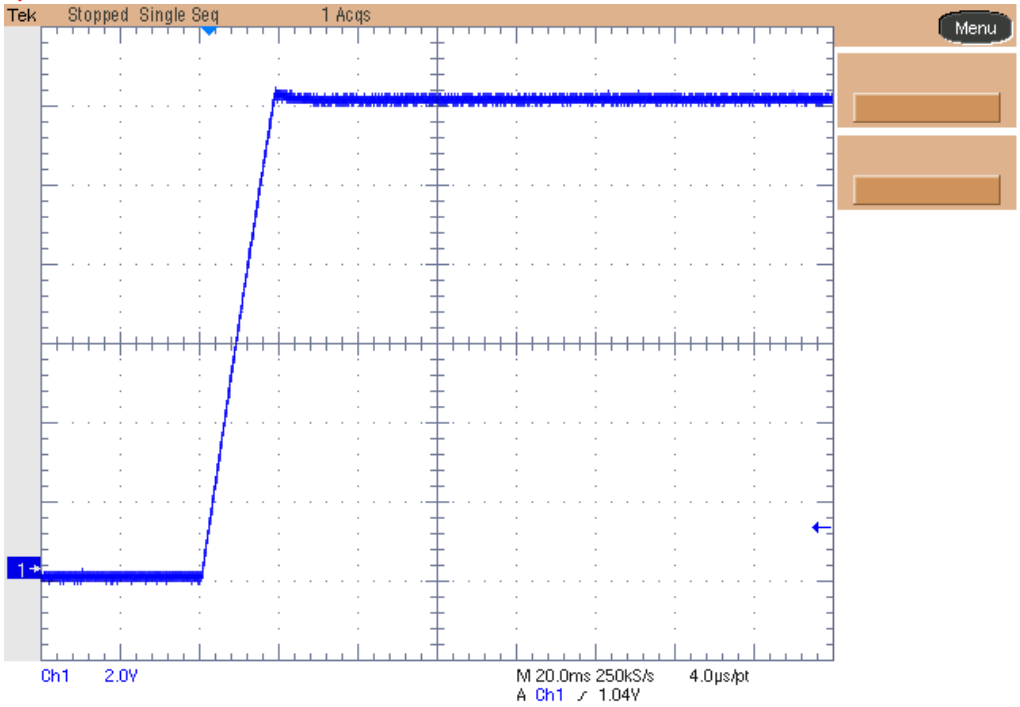
The output voltage behavior at startup is shown in the images below. The input voltage was set to 230Vac. The output fully loaded in the upper picture and unloaded for the bottom one.

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

Iout = 1A;

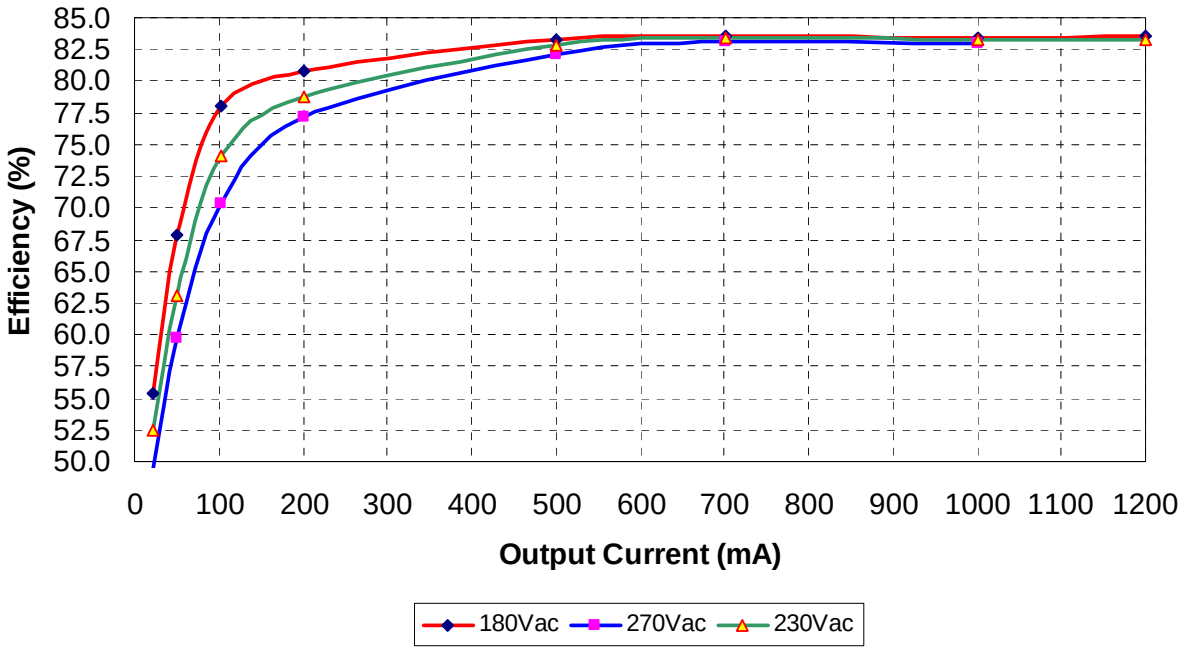


Iout = 0A;



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.



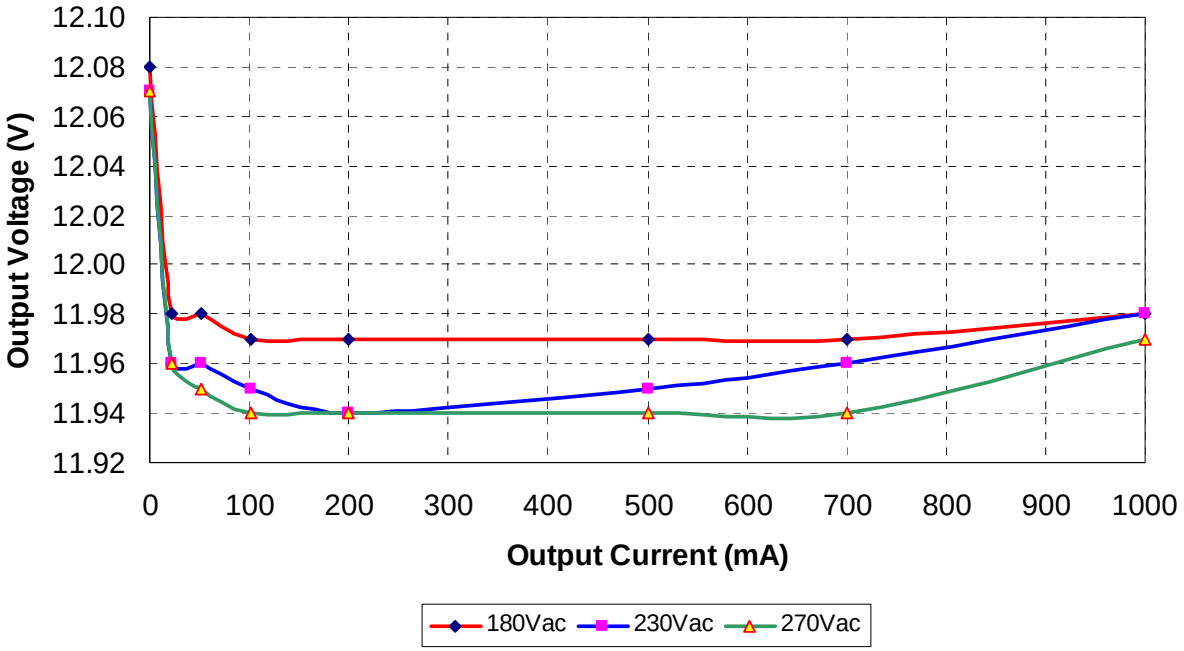
Iout (mA)	Vout (V)	Pout (W)	Pin (W)	Vin (Vac)	Ploss (W)	Eff (%)
0	12.08	0	0.025	180	0.025	0.00
21.5	11.98	0.258	0.465	180	0.207	55.39
50.9	11.98	0.610	0.899	180	0.289	67.83
101.7	11.97	1.217	1.56	180	0.343	78.04
200.5	11.97	2.400	2.97	180	0.570	80.81
500.3	11.97	5.989	7.19	180	1.201	83.29
701.0	11.97	8.391	10.05	180	1.659	83.49
1000.3	11.98	11.984	14.36	180	2.376	83.45
1201	11.44	13.739	16.45	180	2.711	83.52
1219	8.524					
1228	5.860					

Iout (mA)	Vout (V)	Pout (W)	Pin (W)	Vin (Vac)	Ploss (W)	Eff (%)
0	12.07	0	0.027	230	0.027	0.00
21.6	11.96	0.258	0.492	230	0.234	52.51
51.0	11.96	0.610	0.967	230	0.357	63.08
101.7	11.95	1.215	1.64	230	0.425	74.10
200.5	11.94	2.394	3.04	230	0.646	78.75
500.3	11.95	5.979	7.22	230	1.241	82.81
701.0	11.96	8.384	10.05	230	1.666	83.42
1000.2	11.98	11.982	14.39	230	2.408	83.27
1201	11.98	14.388	17.27	230	2.882	83.31
1228	9.352					
1236	7.089					

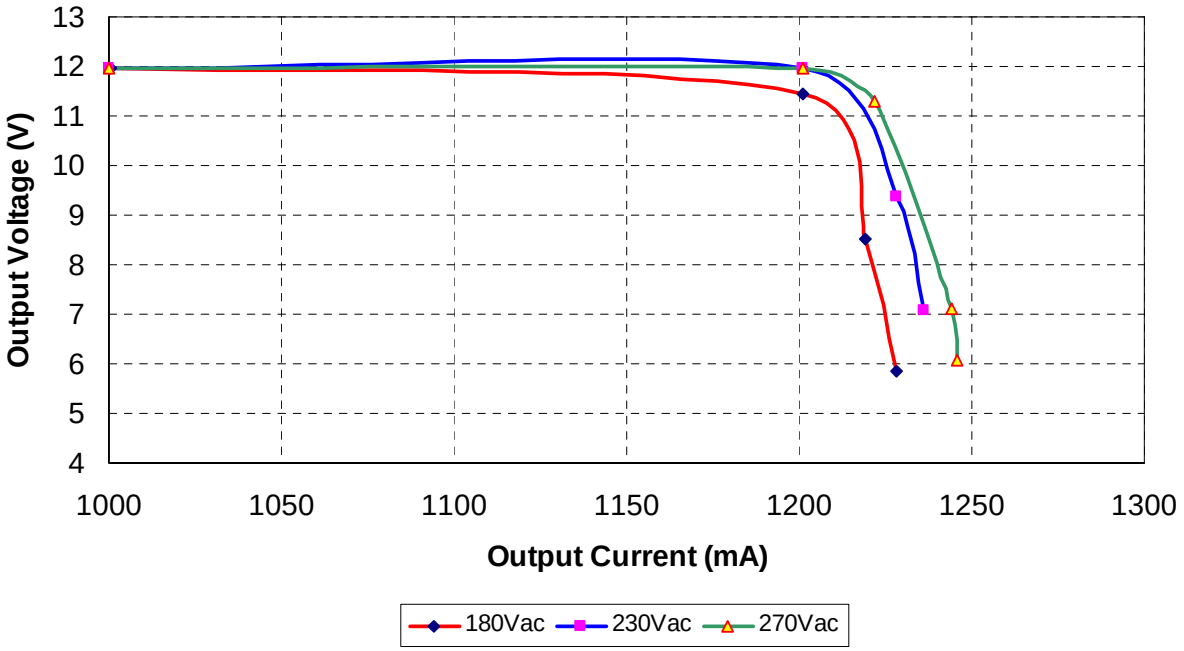
Iout (mA)	Vout (V)	Pout (W)	Pin (W)	Vin (Vac)	Ploss (W)	Eff (%)
0	12.07	0	0.031	270	0.031	0.00
21.5	11.96	0.257	0.521	270	0.264	49.36
51.0	11.95	0.609	1.020	270	0.411	59.75
101.8	11.94	1.215	1.728	270	0.513	70.34
200.5	11.94	2.394	3.104	270	0.710	77.13
500.3	11.94	5.974	7.27	270	1.296	82.17
701.0	11.94	8.370	10.07	270	1.700	83.12
1000.2	11.97	11.972	14.42	270	2.448	83.03
1201	11.97	14.376	17.39	270	3.014	82.67
1222	11.29					
1244	7.104					
1246	6.085					

2 Output Voltage Regulation

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



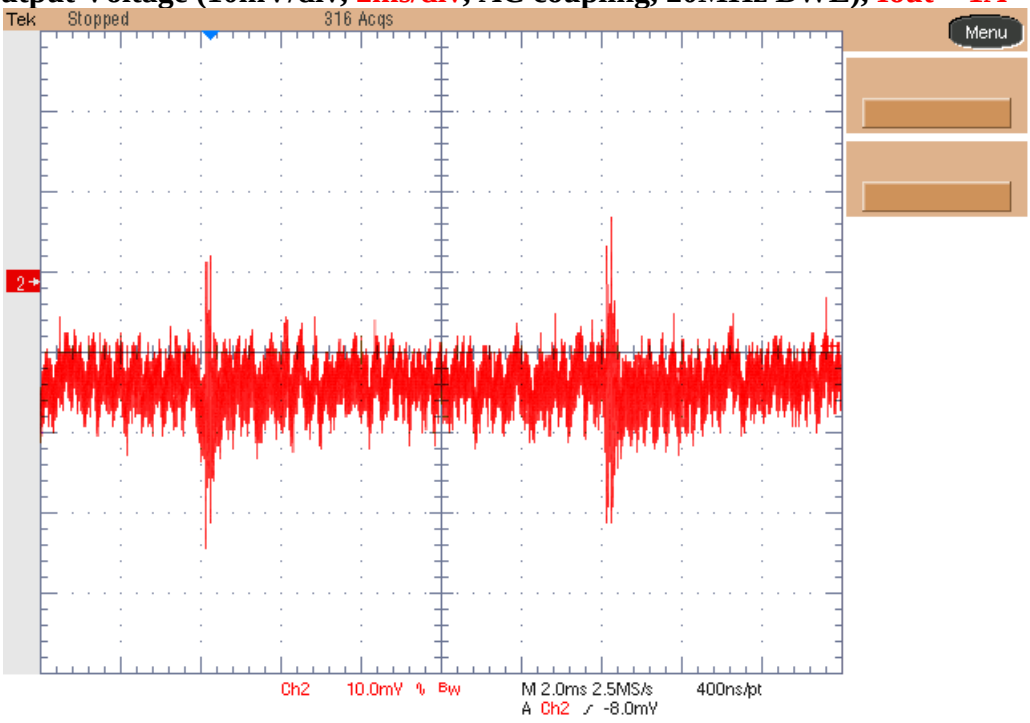
The converter has been loaded with higher current than nominal load in order to measure the current limit curve, for each input AC voltage:



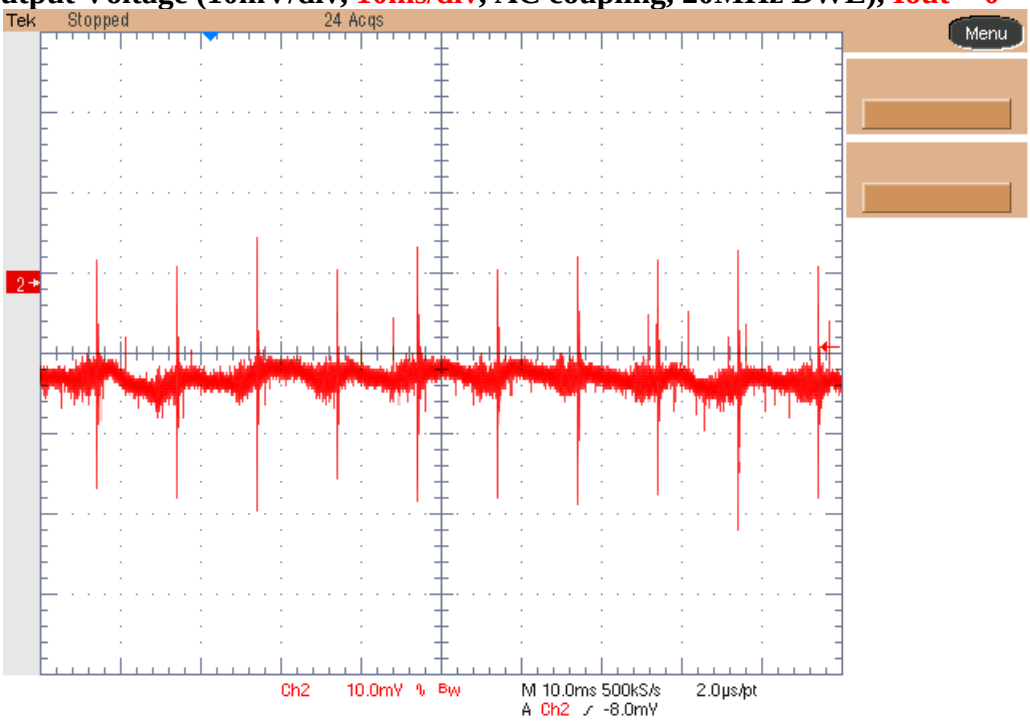
3 Output Ripple Voltage

The output ripple voltage is shown in the plots below. The input was set to 230Vac and the output fully loaded (top picture) and unloaded (bottom one).

Ch.2: Output Voltage (10mV/div, 2ms/div, AC coupling, 20MHz BWL), Iout = 1A



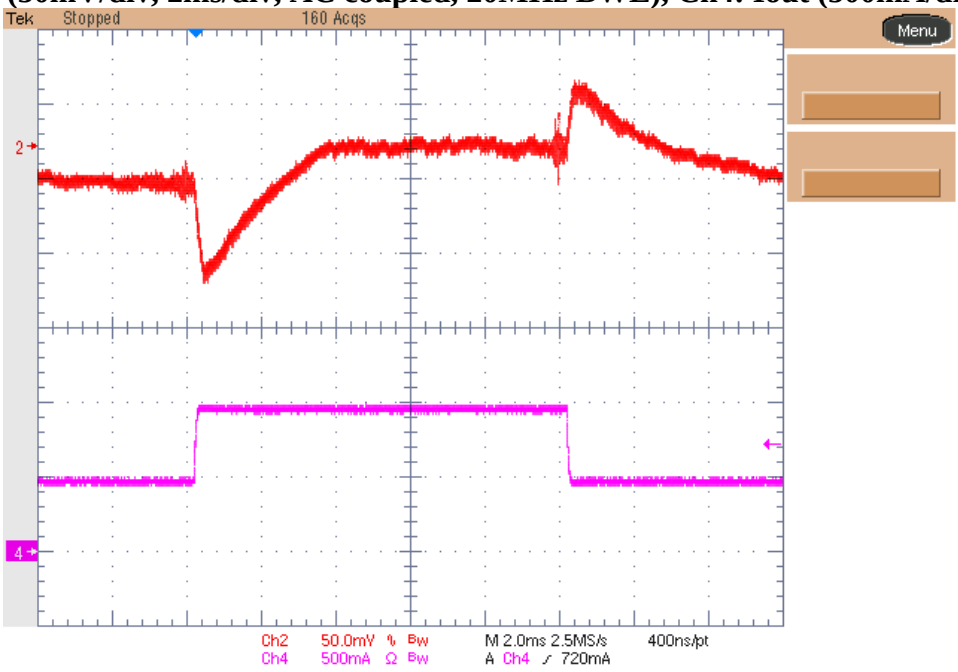
Ch.2: Output Voltage (10mV/div, 10ms/div, AC coupling, 20MHz BWL), Iout = 0



4 Transient Response

The image below shows the transient response on the output voltage when the load has been switched between 50% and 100% of the nominal value, at 230Vac.

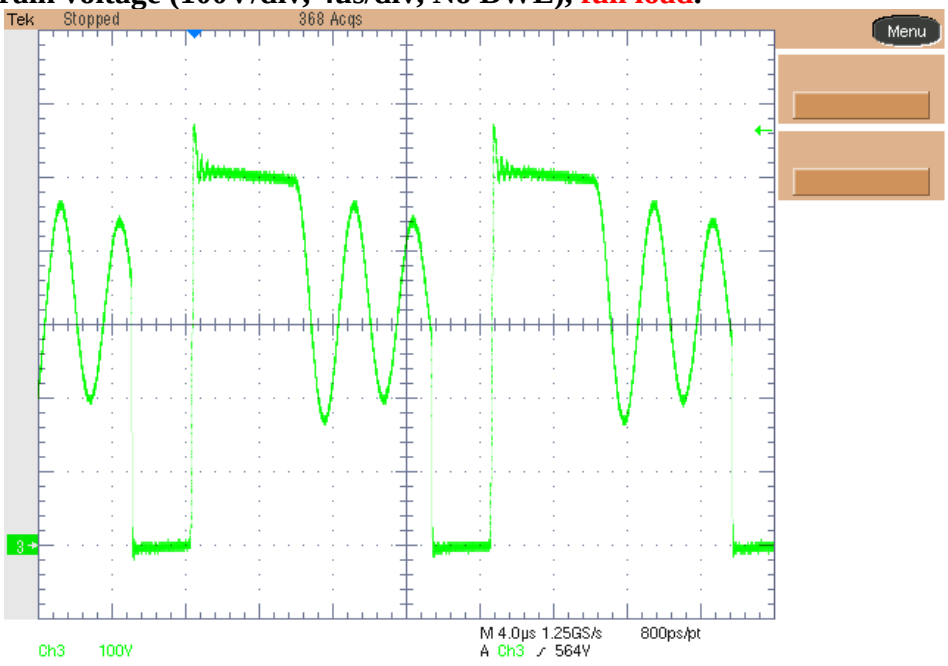
Ch2: Vout (50mV/div, 2ms/div, AC coupled, 20MHz BWL), Ch4: Iout (500mA/div)



5 Switching Node Waveform

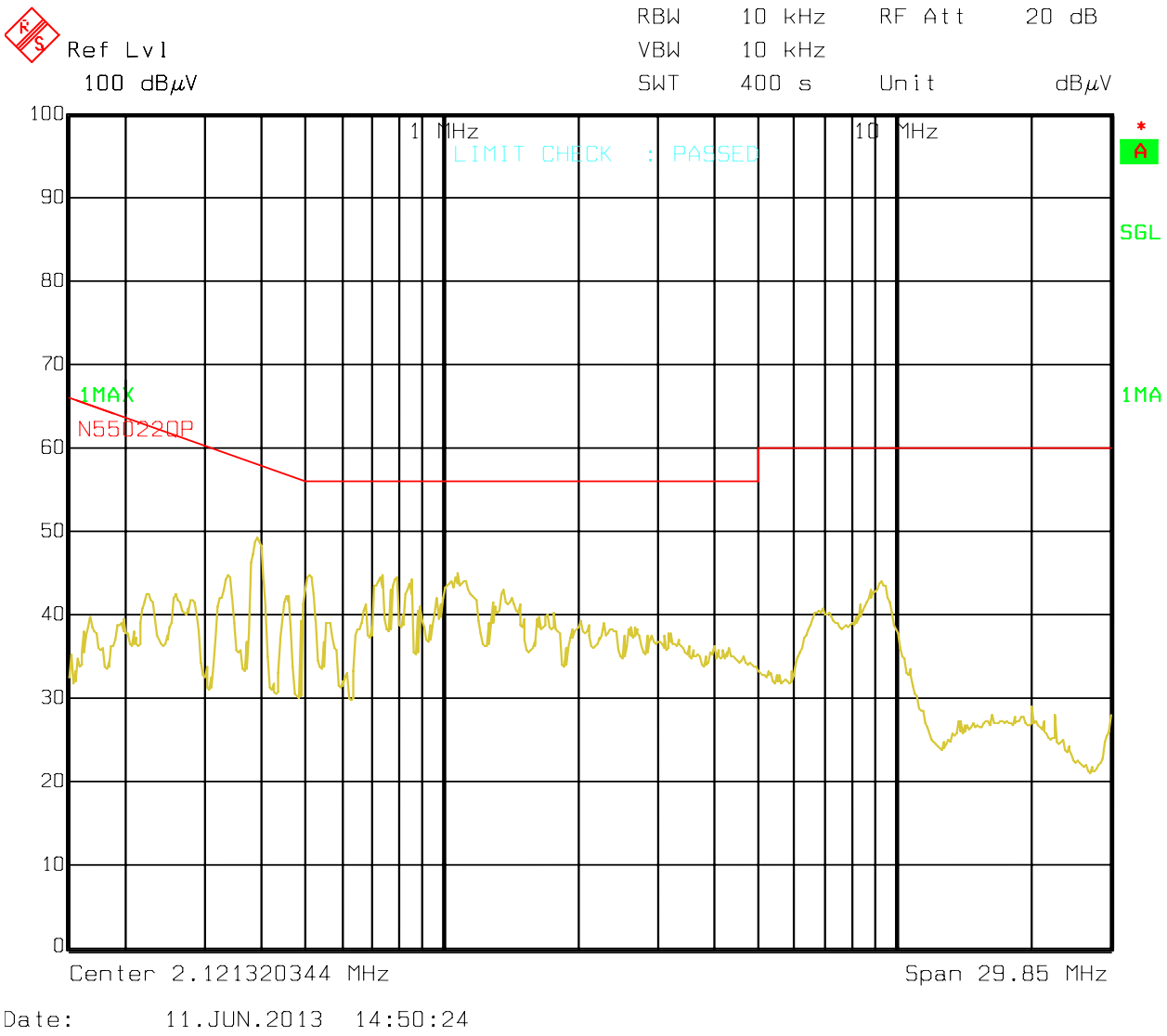
The image below shows the peak voltage on the drain of the Mosfet Q1 with a 230Vac and full load.

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 12 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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