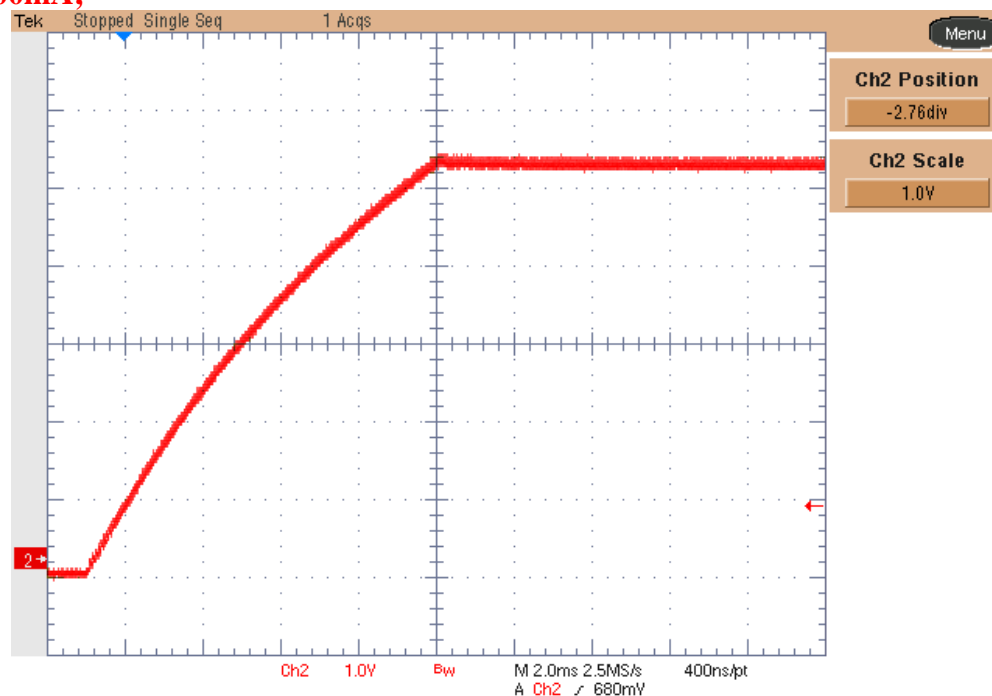


1 Startup

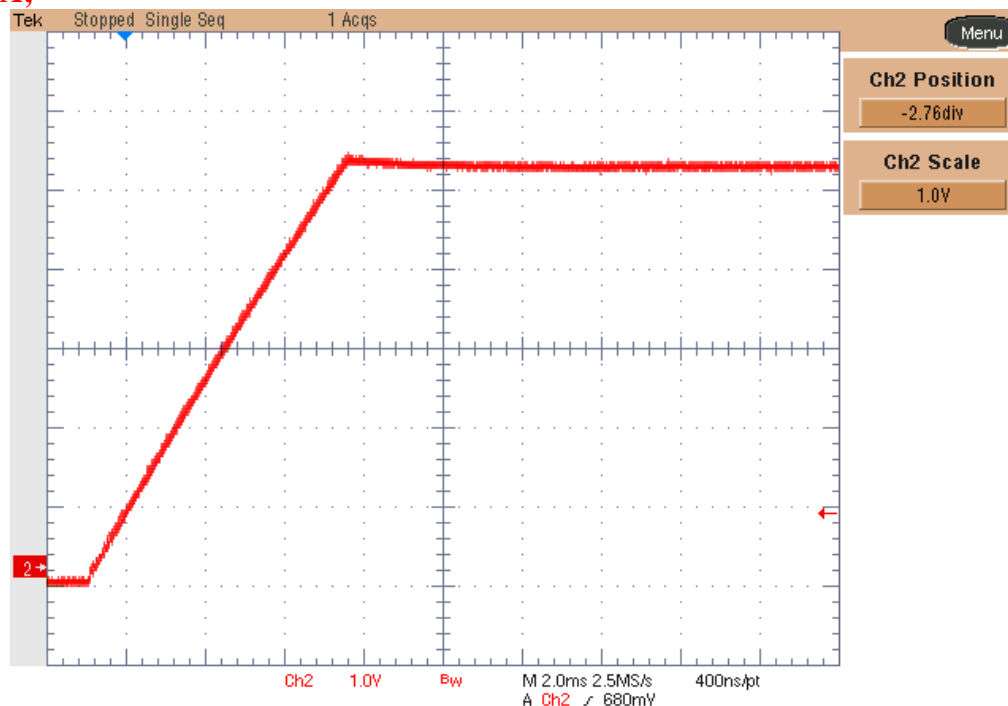
The output voltage behavior at startup is shown in the images below. The input voltage was set to 320Vdc. The output fully loaded in the upper picture and unloaded for the bottom one.

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

$I_{out} = 200\text{mA}$;

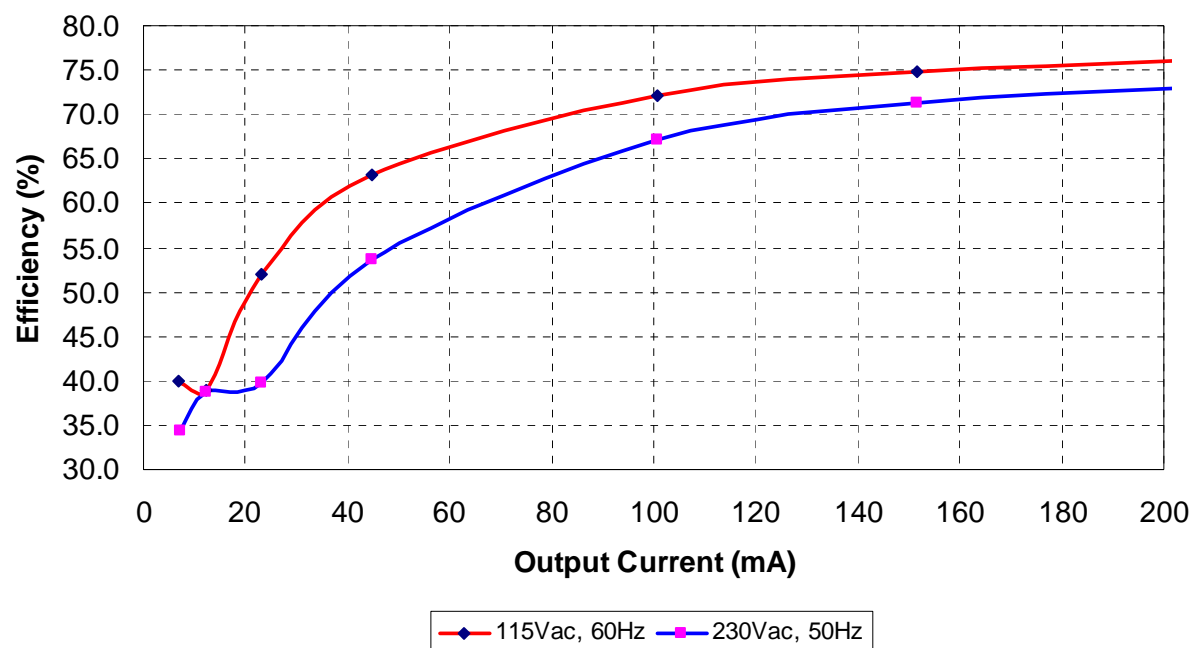


$I_{out} = 0\text{A}$;



2 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 115Vac, 60Hz and 230Vac, 50Hz.

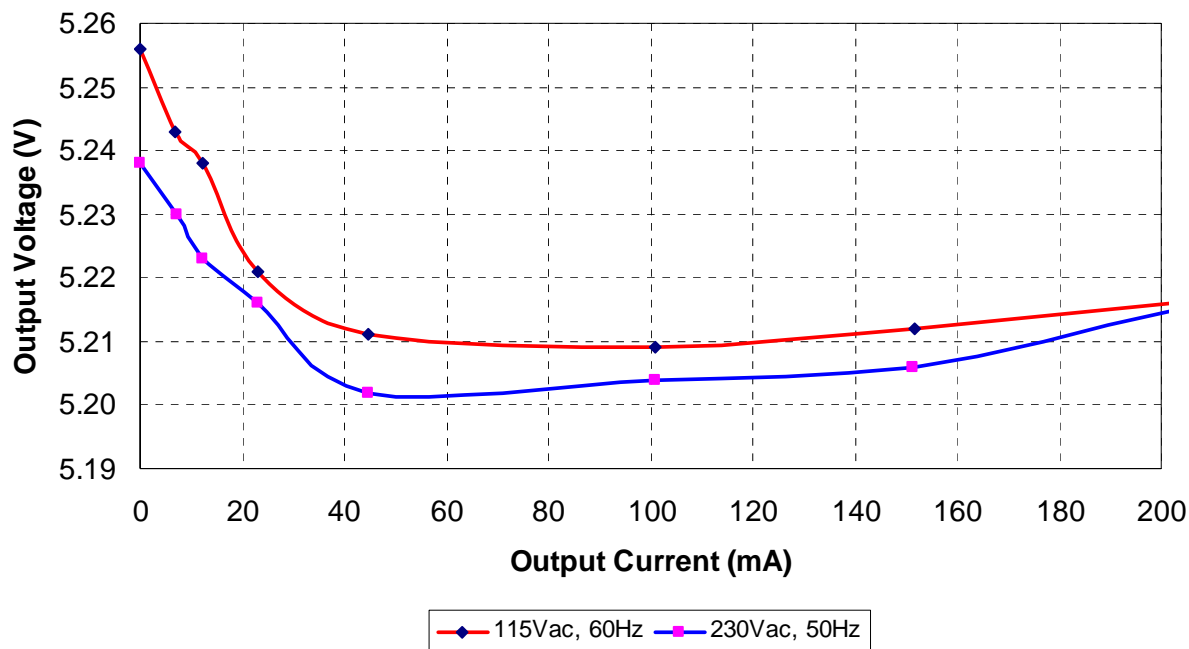


I _{out} (mA)	V _{out} (V)	P _{out} (W)	P _{in} (W)	V _{in} (Vac)	P _{loss} (W)	Eff (%)
0	5.256	0	0.021	115	0.021	0.00
7.0	5.243	0.037	0.092	115	0.055	39.89
12.4	5.238	0.065	0.167	115	0.102	38.89
23.2	5.221	0.121	0.233	115	0.112	51.99
44.7	5.211	0.233	0.368	115	0.135	63.30
100.8	5.209	0.525	0.729	115	0.204	72.03
151.6	5.212	0.790	1.056	115	0.266	74.82
202.4	5.216	1.056	1.389	115	0.333	76.01

I _{out} (mA)	V _{out} (V)	P _{out} (W)	P _{in} (W)	V _{in} (Vac)	P _{loss} (W)	Eff (%)
0	5.238	0	0.039	230	0.039	0.00
7.1	5.230	0.037	0.108	230	0.071	34.38
12.4	5.223	0.065	0.167	230	0.102	38.78
23.2	5.216	0.121	0.304	230	0.183	39.81
44.7	5.202	0.233	0.433	230	0.200	53.70
100.8	5.204	0.525	0.782	230	0.257	67.08
151.5	5.206	0.789	1.106	230	0.317	71.31
202.4	5.215	1.056	1.448	230	0.392	72.89

3 Output Voltage Regulation

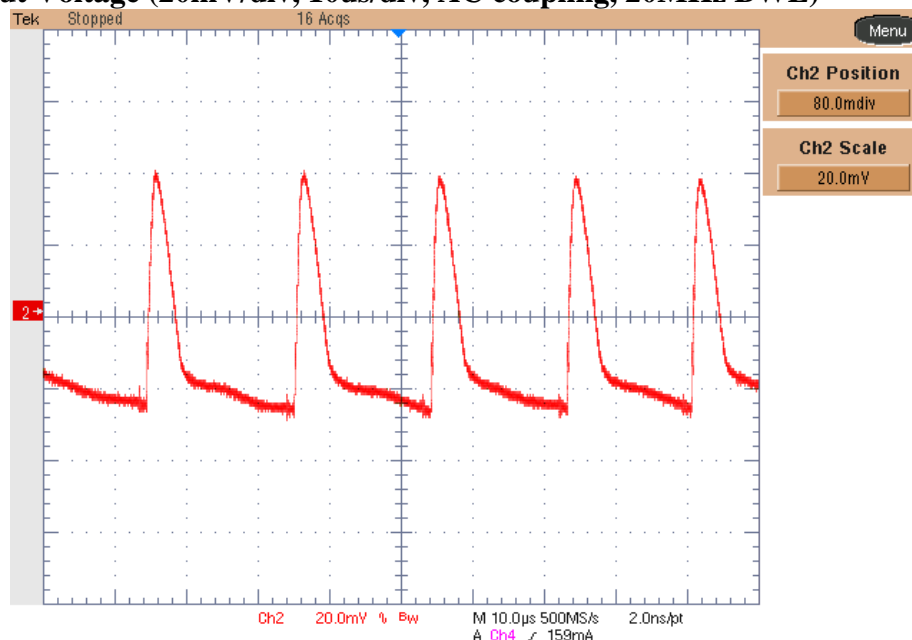
The output voltage variation as function of load and input voltage is shown below:



4 Output Ripple Voltage

The output ripple voltage is shown in the plot below. The input was set to 320Vdc and the output fully loaded.

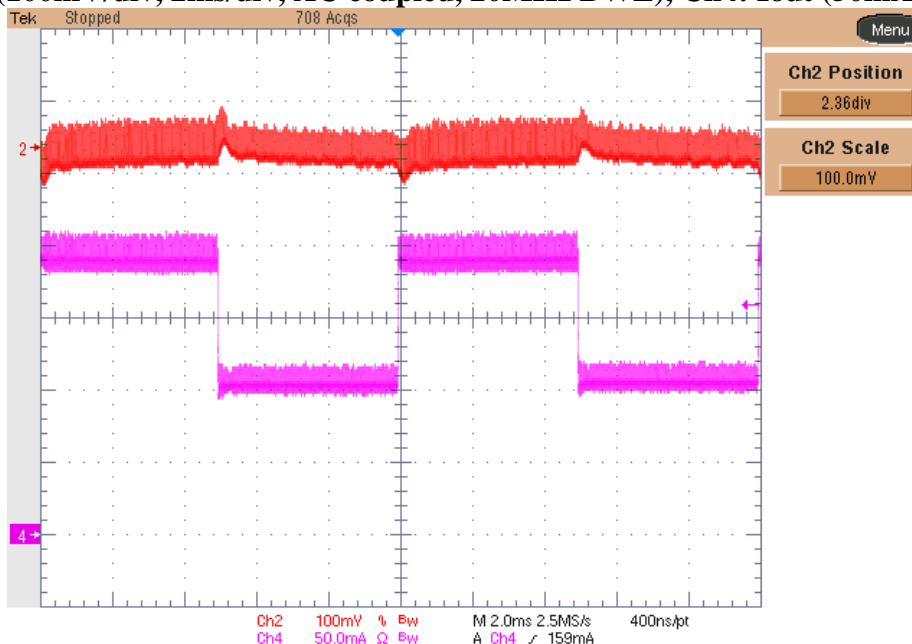
Ch.2: Output Voltage (20mV/div, 10us/div, AC coupling, 20MHz BWL)



5 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.

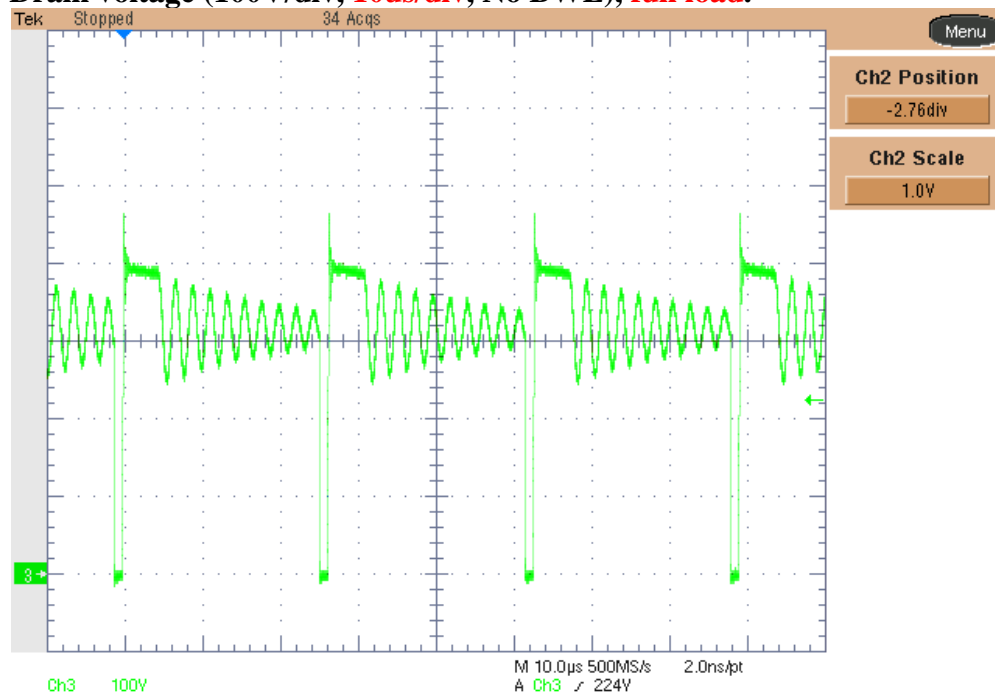
Ch1: Vout (100mV/div, 2ms/div, AC coupled, 20MHz BWL), Ch4: Iout (50mA/div)



6 Switching Node Waveform

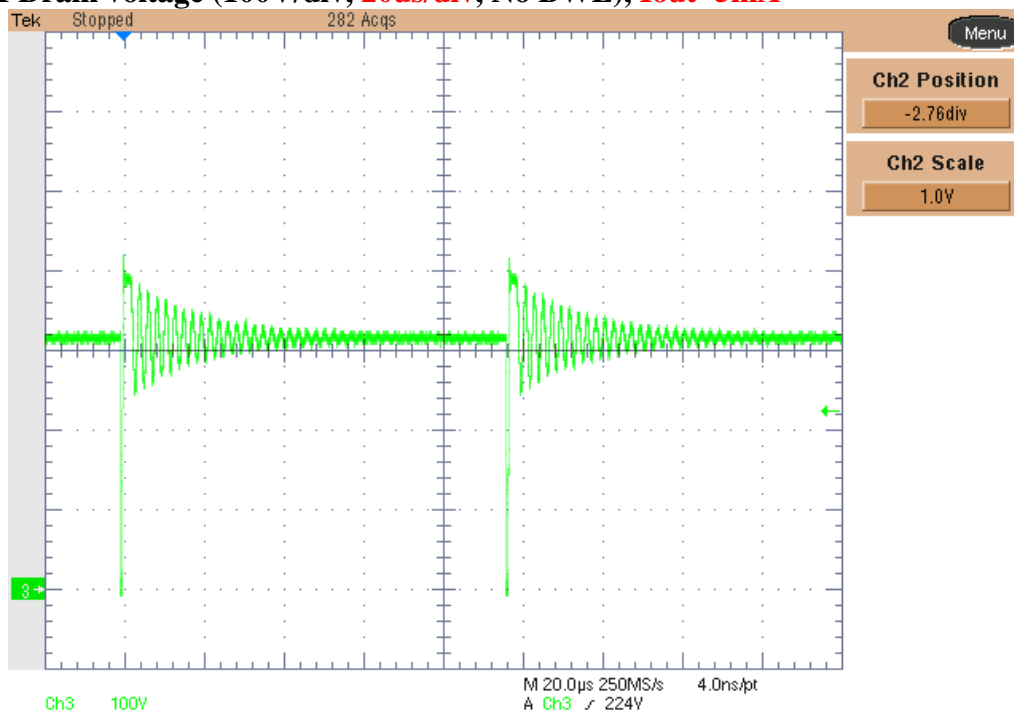
The images below show the peak voltage on the drain of the Mosfet Q1 with a 320Vdc input at different loads, as well as the voltage on D4.

Ch3: Q1 Drain voltage (100V/div, 10us/div, No BWL), full load.

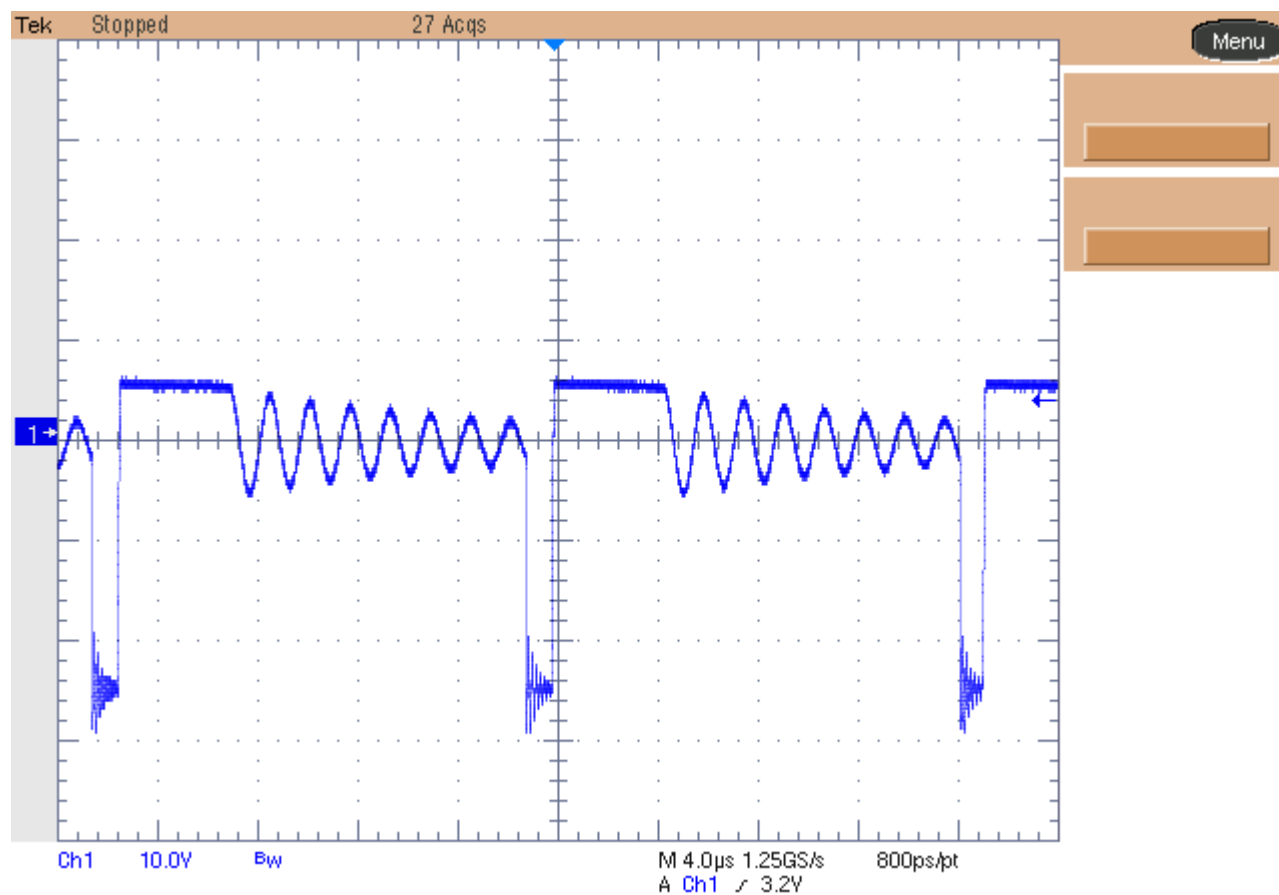


At light load, the converter reduces the switching frequency as shown in the picture below.

Ch3: Q1 Drain voltage (100V/div, 20us/div, No BWL), Iout=5mA



Ch1: D4 Anode voltage (10V/div, 4 μ sec/div, 20 MHz BWL), Full Load



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