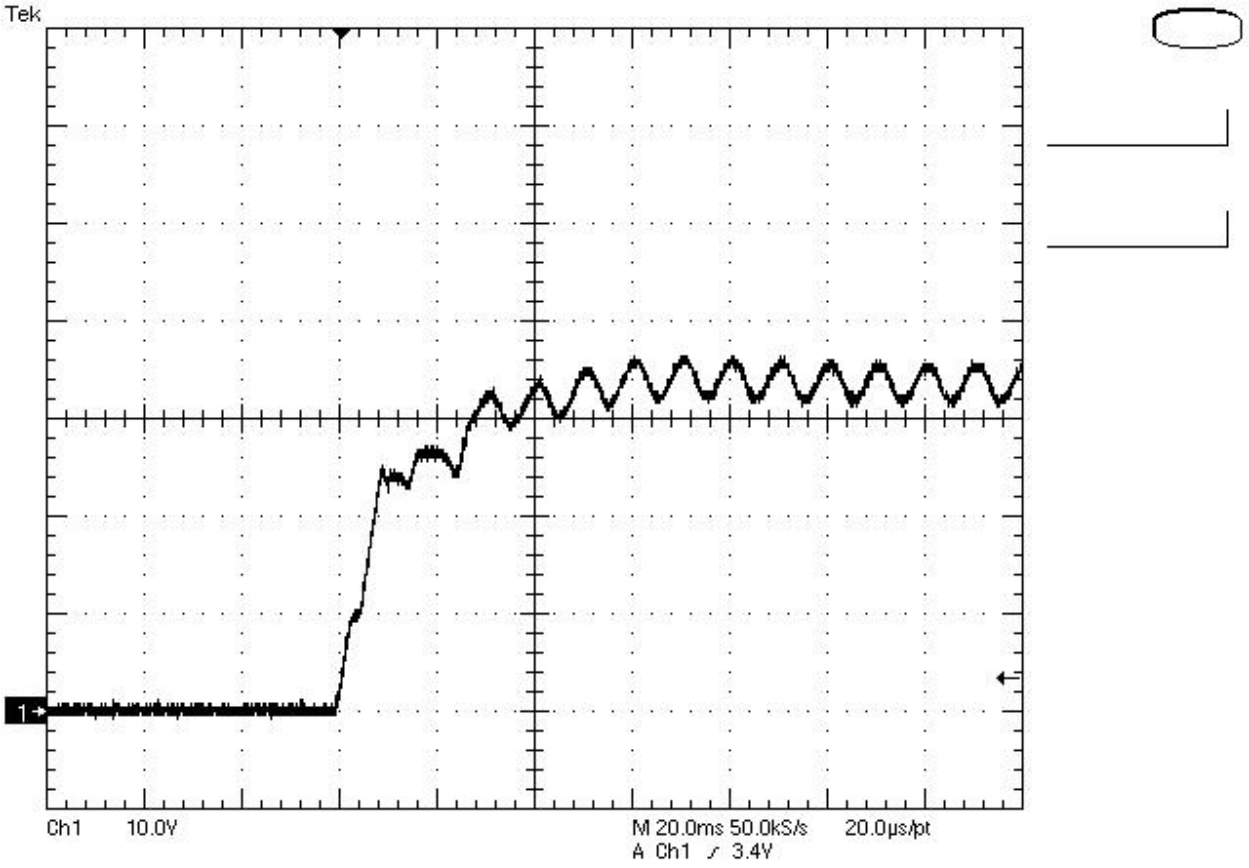
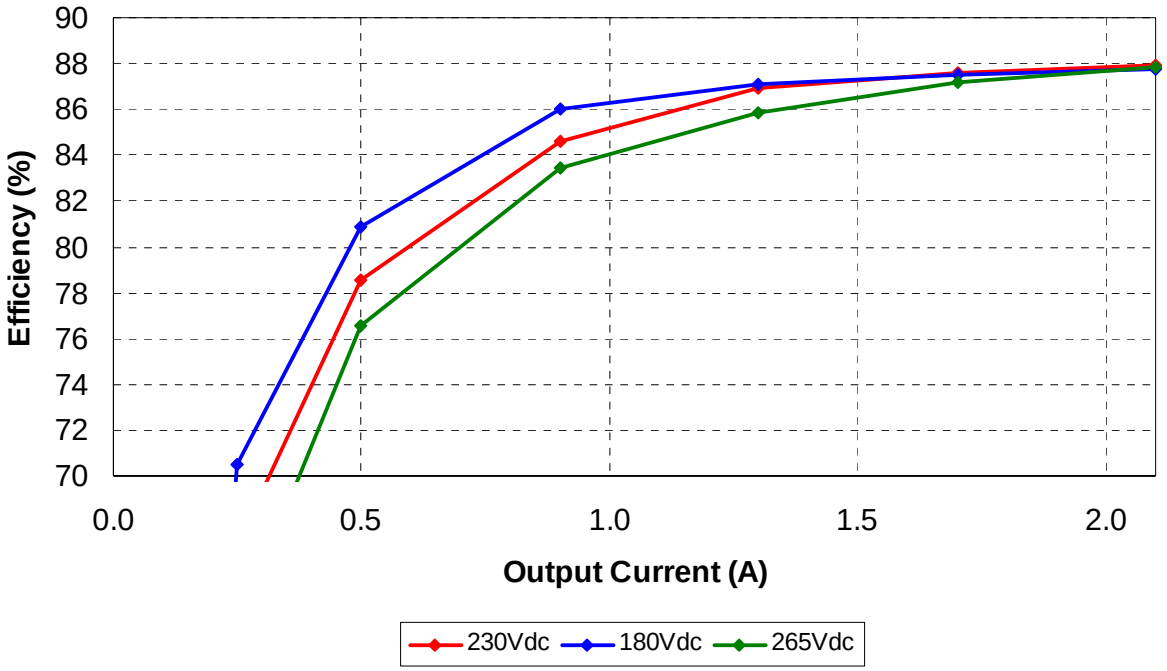
1 Startup

The output voltage at startup is shown in the image below. Input voltage is 230Vac. The output was loaded with 2.1A.
Channel 1 shows the output voltage (10 V/div, 20ms/div).



2 Efficiency

The efficiency data is shown in the tables and graph below. For simplicity and accuracy of measurements, the data was measured using a DC input.



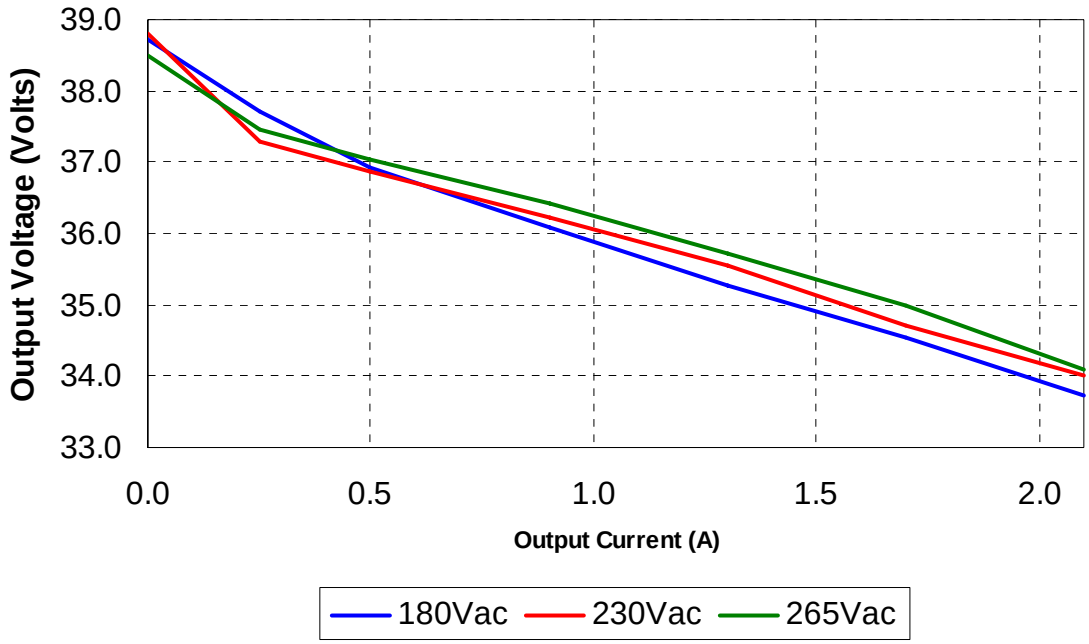
Iout (A)	Vout (Vdc)	Pout (W)	Iin (mA)	Vin (Vdc)	Pin (W)	Ploss (W)	Eff (%)
0.000	38.83	0.00	4.9	230	1.13	1.13	0.0
0.255	37.36	9.53	61.5	230	14.15	4.62	67.4
0.500	36.65	18.33	101.4	230	23.32	5.00	78.6
0.900	35.95	32.36	166.2	230	38.23	5.87	84.6
1.300	35.48	46.12	230.7	230	53.06	6.94	86.9
1.700	34.62	58.85	292.1	230	67.18	8.33	87.6
2.100	33.30	69.93	345.9	230	79.56	9.63	87.9

Iout (A)	Vout (Vdc)	Pout (W)	Iin (mA)	Vin (Vdc)	Pin (W)	Ploss (W)	Eff (%)
0.000	38.73	0.00	7.4	180	1.33	1.33	0.0
0.250	37.70	9.43	74.3	180	13.37	3.95	70.5
0.500	36.81	18.41	126.4	180	22.75	4.35	80.9
0.900	36.04	32.44	209.5	180	37.71	5.27	86.0
1.300	35.46	46.10	294.1	180	52.94	6.84	87.1
1.700	34.38	58.45	371.2	180	66.82	8.37	87.5
2.100	33.03	69.36	439.0	180	79.02	9.66	87.8

Iout (A)	Vout (Vdc)	Pout (W)	Iin (mA)	Vin (Vdc)	Pin (W)	Ploss (W)	Eff (%)
0.000	38.90	0.00	4.2	265	1.11	1.11	0.0
0.250	37.22	9.31	55.4	265	14.68	5.38	63.4
0.500	36.67	18.34	90.4	265	23.96	5.62	76.5
0.900	36.01	32.41	146.6	265	38.85	6.44	83.4
1.300	35.50	46.15	202.9	265	53.77	7.62	85.8
1.700	34.68	58.96	255.2	265	67.63	8.67	87.2
2.100	33.45	70.25	301.8	265	79.98	9.73	87.8

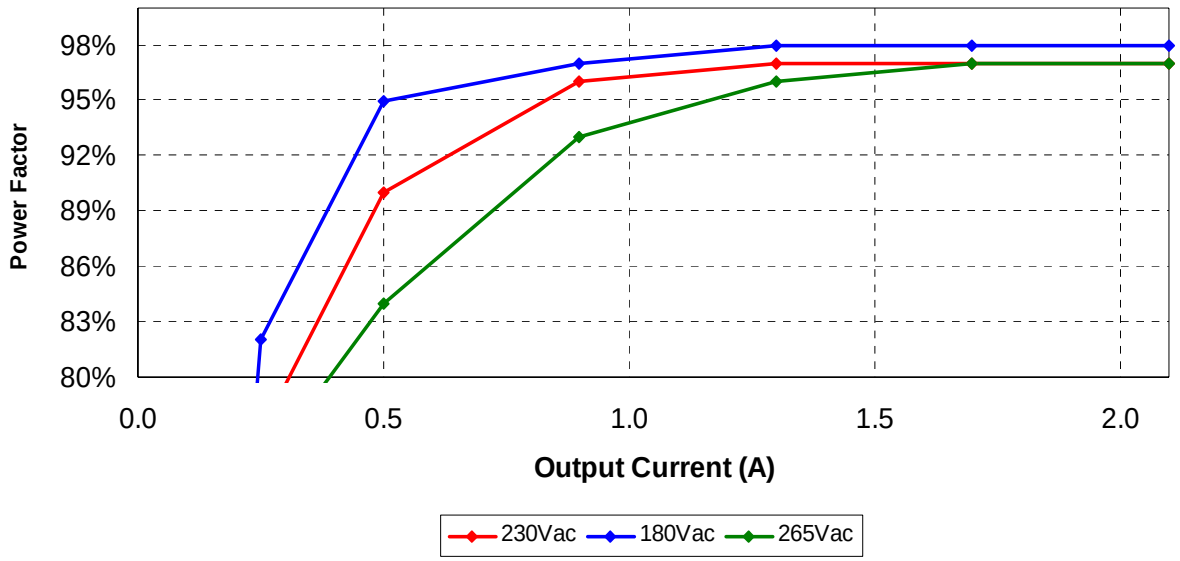
3 Output Voltage Regulation

The output voltage versus load current is plotted below.



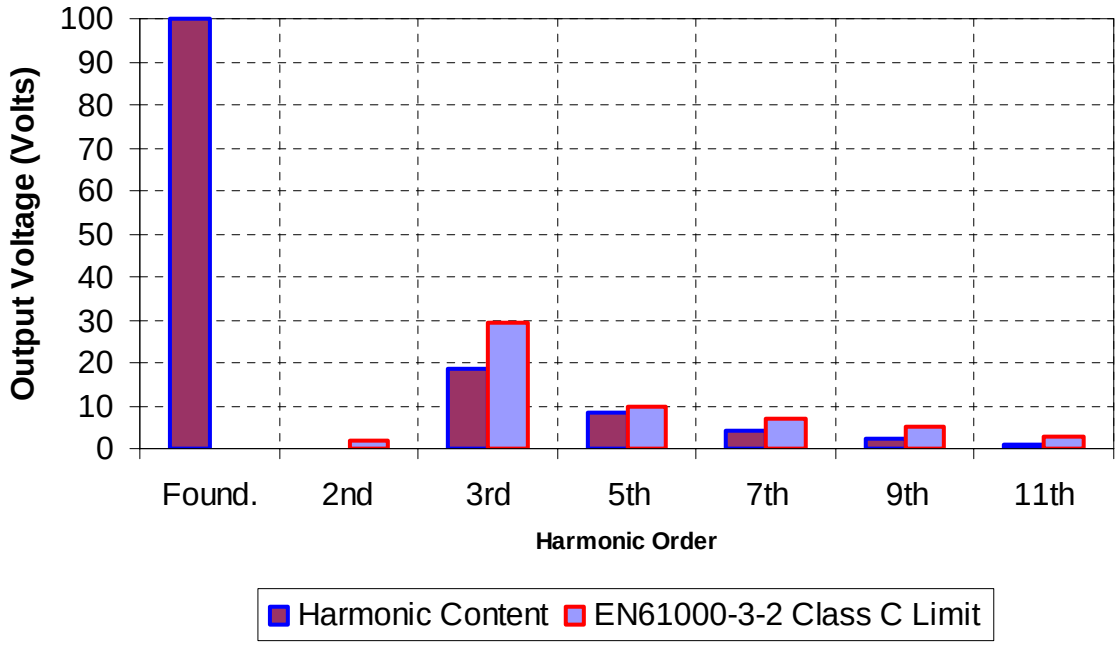
4 Power Factor

The Power Factor graph for the three input voltages is shown below:



5 Harmonic Content

The harmonic content and the EN61000-3-2 Class C (lighting equipments) Limits are shown below; input voltage was set to 230Vac, output load to 2.1A:

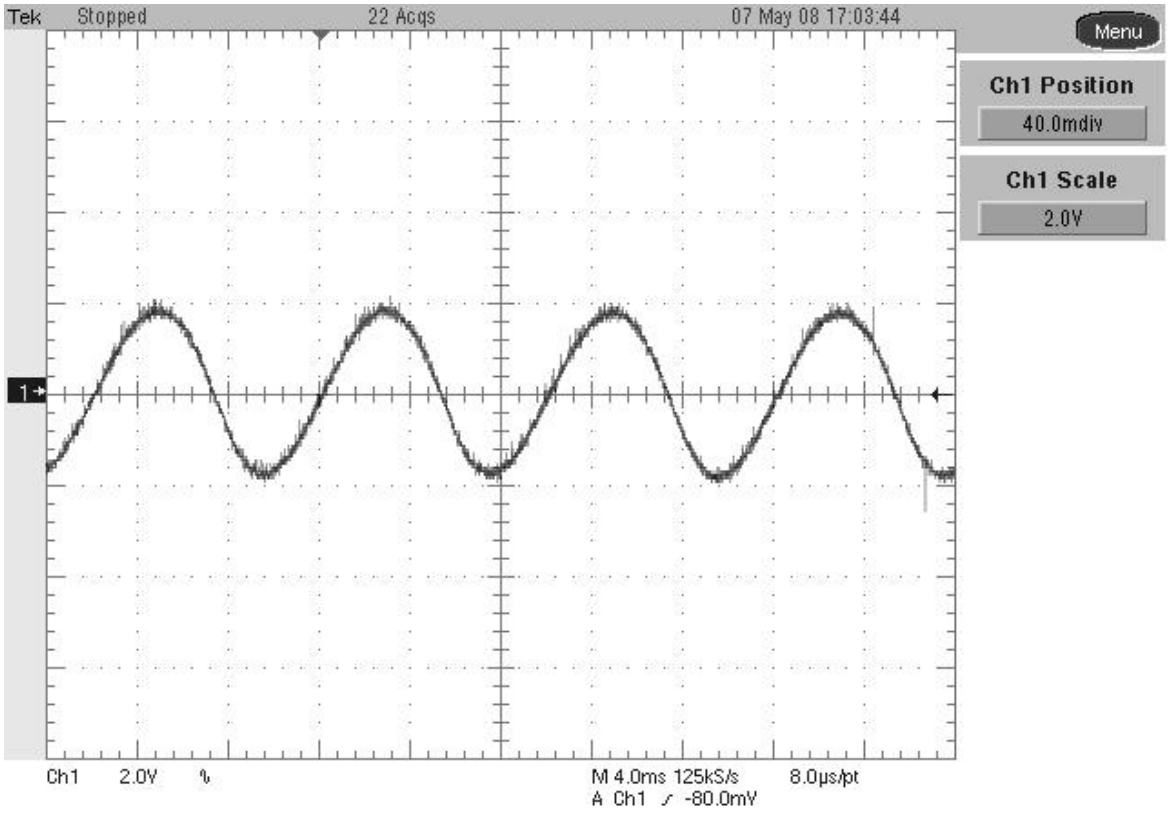


The measured THD was 21.4%; below are shown the harmonic current contents:

Harmonic Order	Current (mA)	%	EN61000-3-2 Class C Limit
Found.	347.5	100.0	//
2nd	0.8	0.2	2.0
3rd	65.4	18.6	29.1
5th	28.8	8.2	10.0
7th	45.2	4.3	7.0
9th	8.0	2.3	5.0
11th	3.4	1.0	3.0

6 Output Ripple Voltage

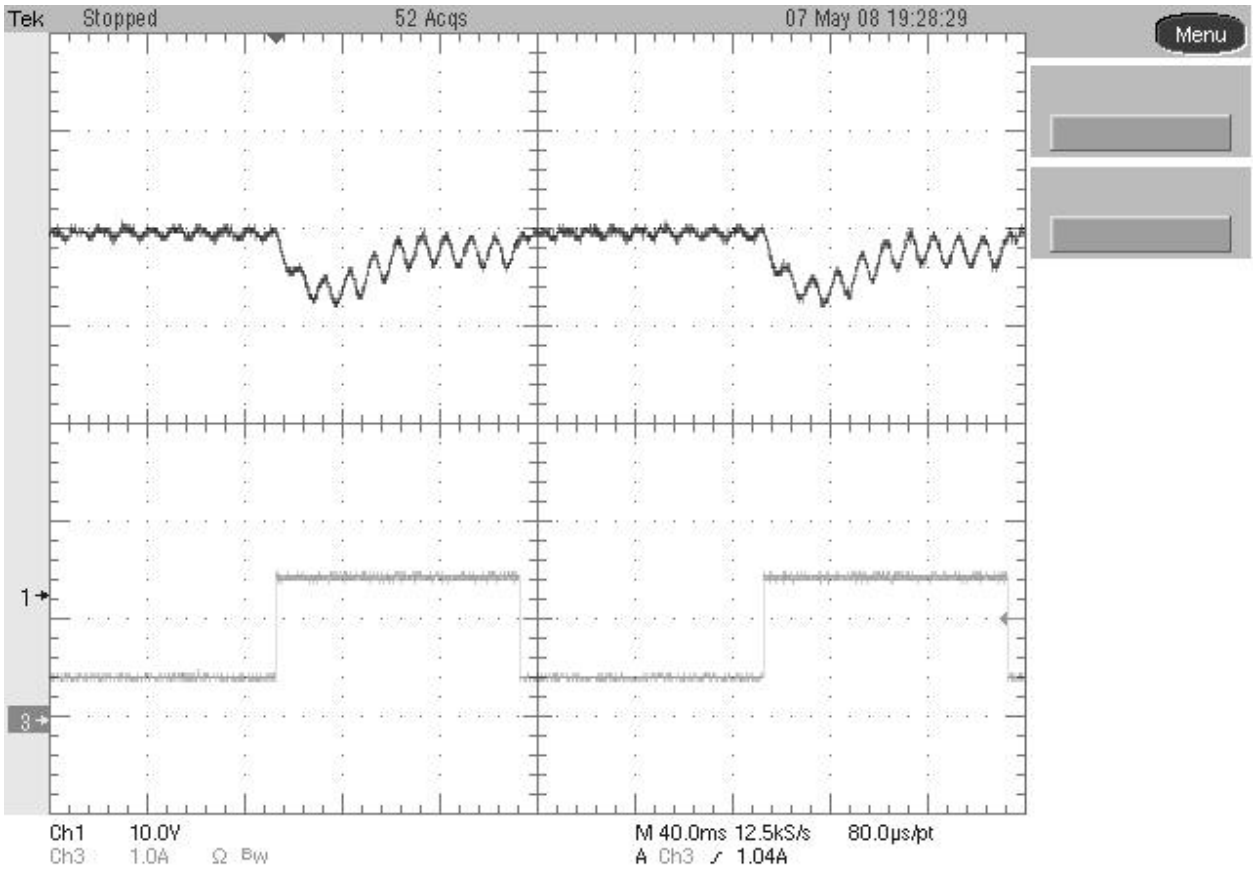
The output ripple voltage is shown in the plot below. The input was set at 230Vac and the load was set to 2.1A. Channel 1 shows the output ac voltage (2 V/div, 40ms/div).



7 Load Transient

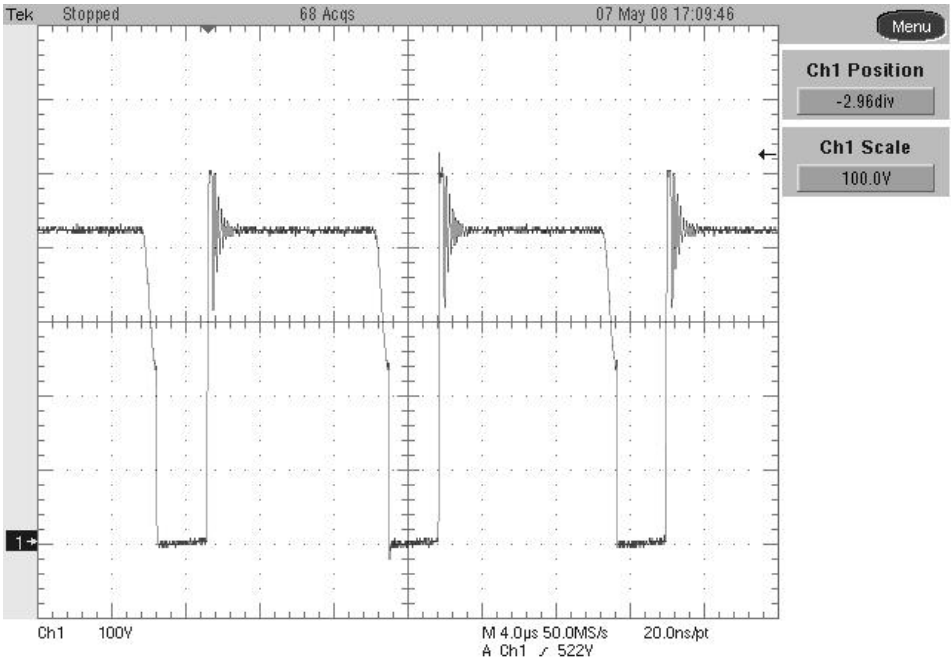
The image below shows the response to 0.5A to 1.5A load transient on the output voltage. The input voltage was set to the nominal value 230Vac.

Channel 1: Vout (dc coupled) 10V/div, Channel 3: Iout 1A/div.

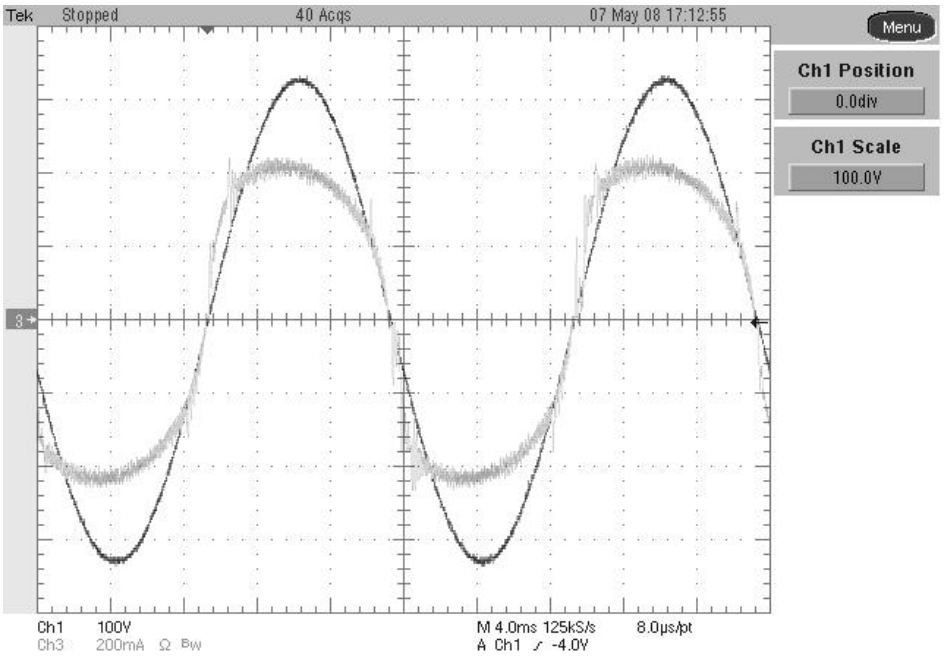


8 Switching Node Waveform

The image below shows the voltage on the drain of the switching node (Q1), with a 230Vac input, and a 2.1A load.

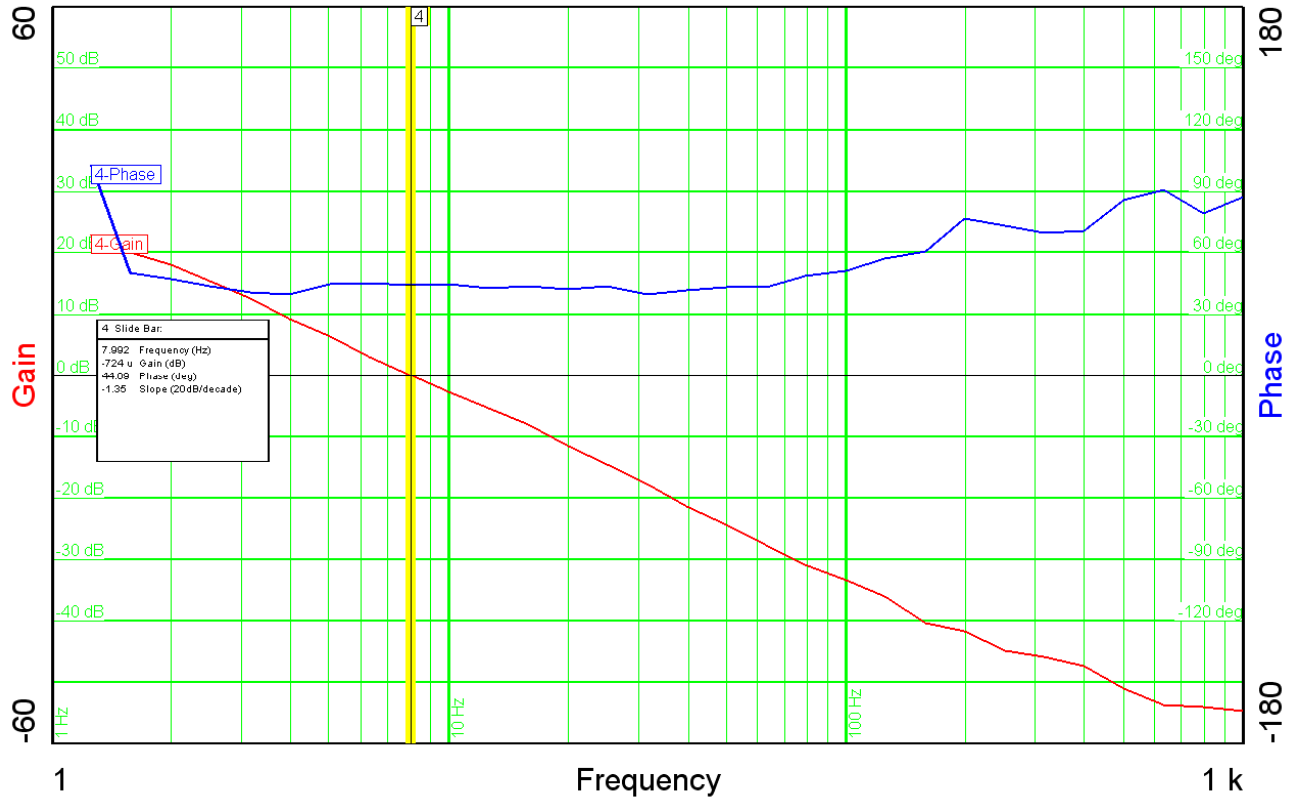


9 Voltage and Input Current Waveform

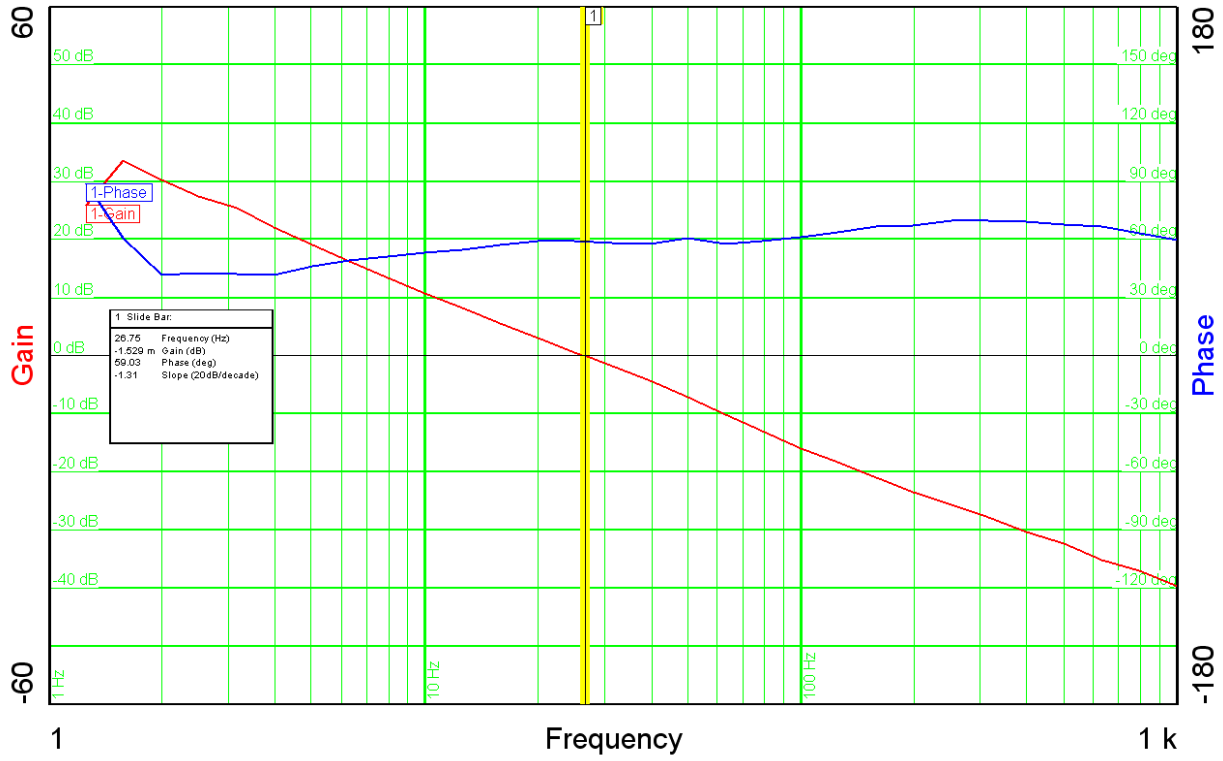


10 Loop Response

The image below shows the loop response of the converter measured with a 230Vdc input, and full load (2.1A). Phase margin is 44.09 deg. and crossover frequency is 7.99 Hz.



The image below shows the loop response of the converter measured with a 230Vdc input, and the load was set to 0.5A. Phase margin is 59.03 deg. and crossover frequency is 26.75 Hz.



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