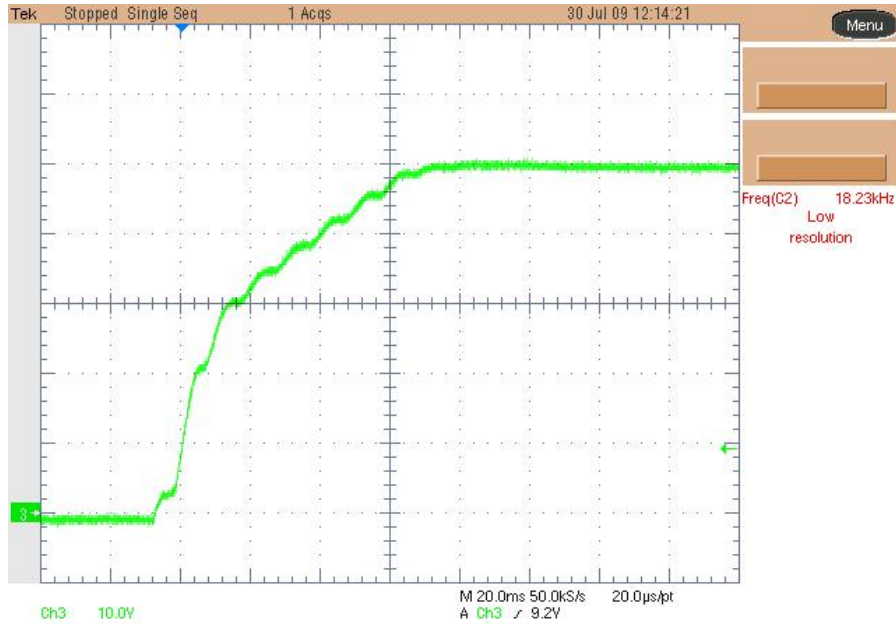


## 1 Startup

The output voltage at startup is shown in the images below. Input voltage is 230Vac. Channel 3 shows the output voltage (10V/div, 20ms/div).

### No Load:

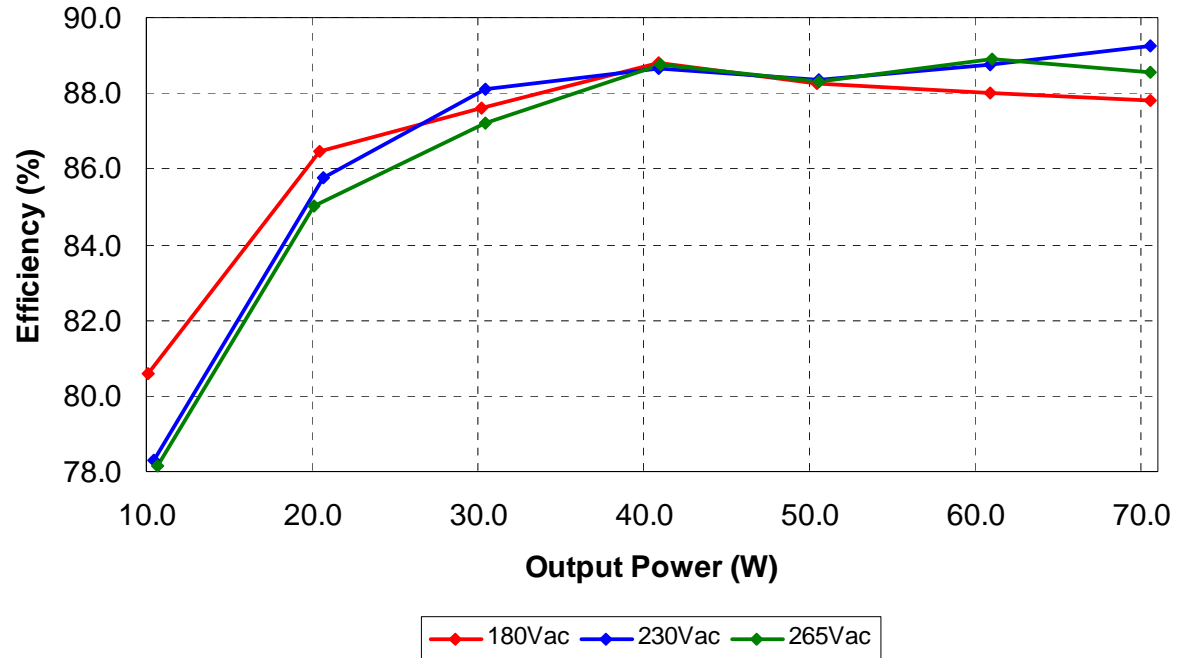


### Full Load:



## 2 Efficiency

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



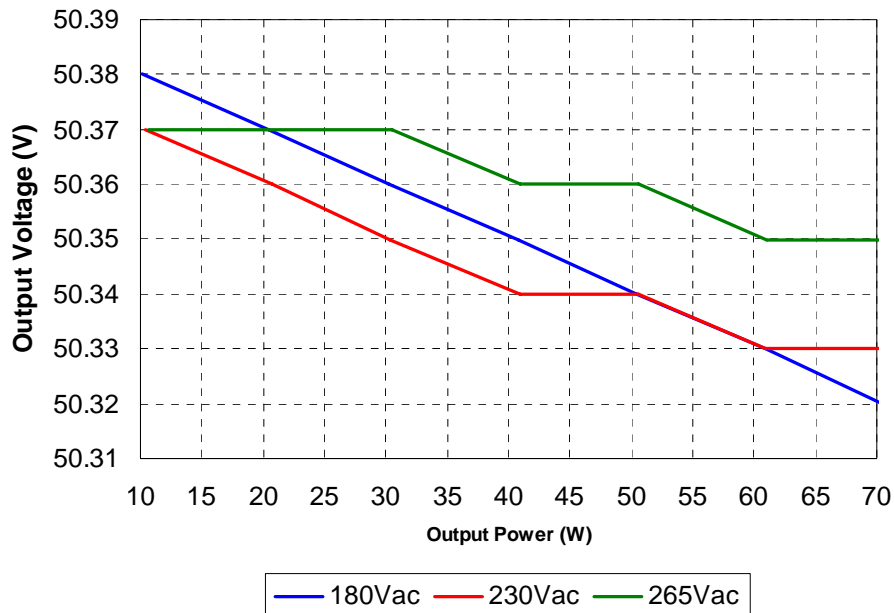
Iout (mA)	Vout (Vdc)	Pout (W)	Vin (Vac)	Pin (W)	Ploss (W)	Eff (%)	PF
0.0	50.38	0.00	230	0.234	0.234	0.00	0.00
206.8	50.37	10.42	230	13.30	2.88	78.32	0.61
410.5	50.36	20.67	230	24.10	3.43	85.78	0.74
603.8	50.35	30.40	230	34.50	4.10	88.12	0.86
812.0	50.34	40.88	230	46.10	5.22	88.67	0.90
1004.0	50.34	50.54	230	57.20	6.66	88.36	0.92
1210.0	50.33	60.90	230	68.60	7.70	88.77	0.94
1401.0	50.33	70.51	230	79.00	8.49	89.26	0.95

Iout (mA)	Vout (Vdc)	Pout (W)	Vin (Vac)	Pin (W)	Ploss (W)	Eff (%)	PF
0.0	50.39	0.00	180	0.204	0.204	0.00	0.00
200.0	50.38	10.08	180	12.50	2.42	80.61	0.71
406.9	50.37	20.50	180	23.70	3.20	86.48	0.88
600.3	50.36	30.23	180	34.50	4.27	87.63	0.93
811.2	50.35	40.84	180	46.00	5.16	88.79	0.95
1003.0	50.34	50.49	180	57.20	6.71	88.27	0.96
1210.0	50.33	60.90	180	69.20	8.30	88.00	0.97
1403.0	50.32	70.60	180	80.40	9.80	87.81	0.98

Iout (mA)	Vout (Vdc)	Pout (W)	Vin (Vac)	Pin (W)	Ploss (W)	Eff (%)	PF
0.0	50.38	0.00	265	0.309	0.309	0.00	0.00
212.5	50.37	10.70	265	13.70	3.00	78.13	0.58
400.0	50.37	20.15	265	23.70	3.55	85.01	0.66
604.2	50.37	30.43	265	34.90	4.47	87.20	0.79
814.2	50.36	41.00	265	46.20	5.20	88.75	0.85
1003.2	50.36	50.52	265	57.20	6.68	88.32	0.89
1211.0	50.35	60.97	265	68.60	7.63	88.88	0.91
1402.0	50.35	70.59	265	79.70	9.11	88.57	0.92

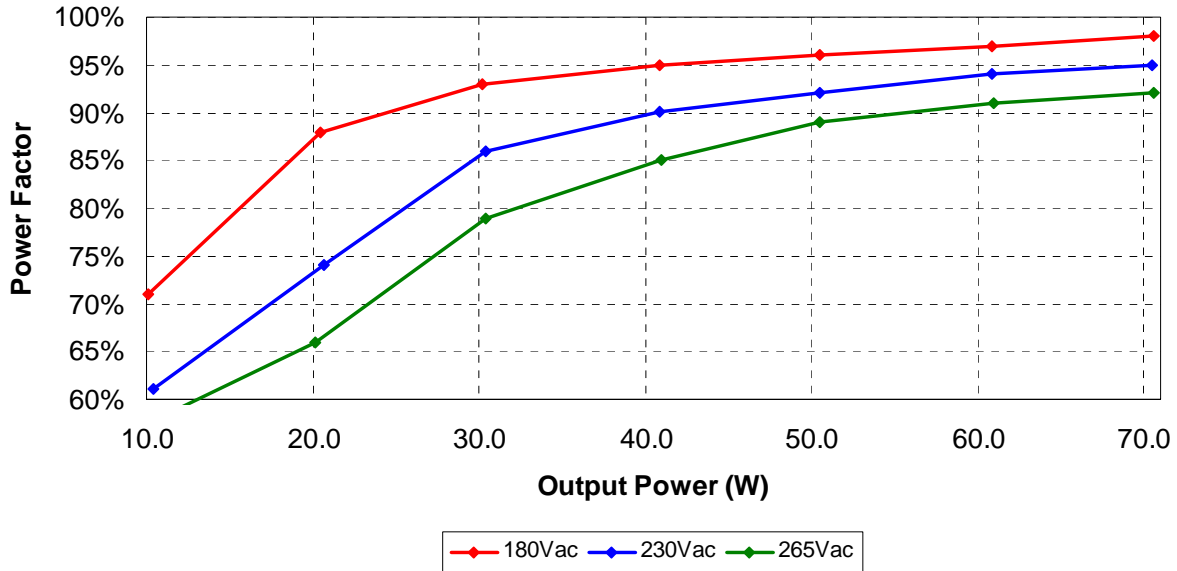
### 3 Output Voltage Regulation

The output voltage versus output power graph is plotted below.



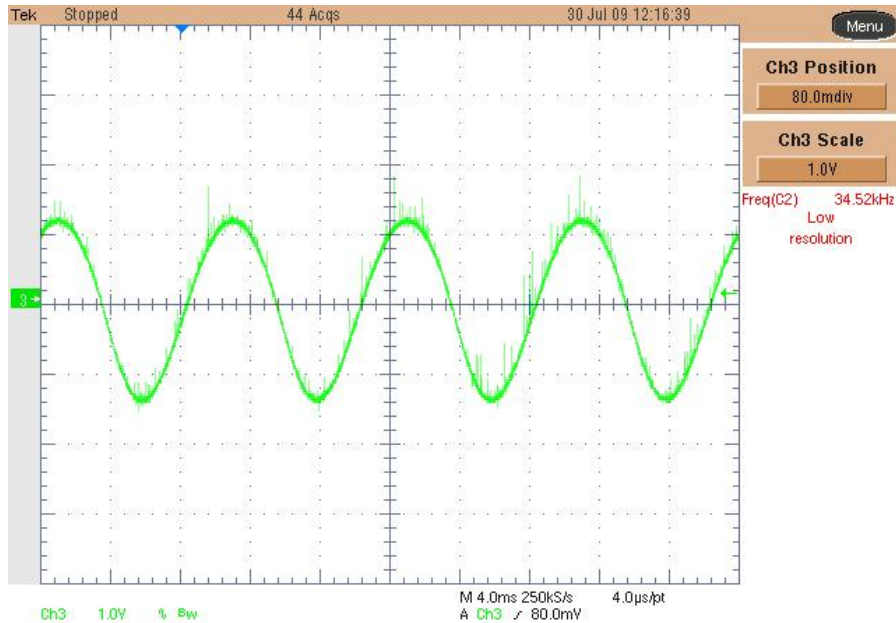
### 4 Power Factor

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



### 5 Output Ripple Voltage

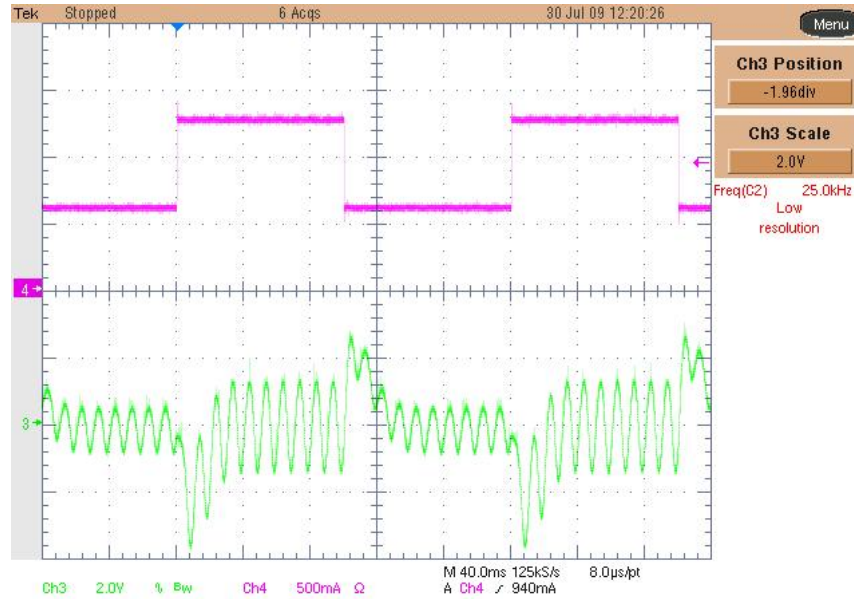
The output ripple voltage is shown in the plot below. The input was set to 230Vac and the load was set to 1.4A. Channel 3 shows the output ac voltage (1 V/div, 4ms/div).



## 6 Transient Response

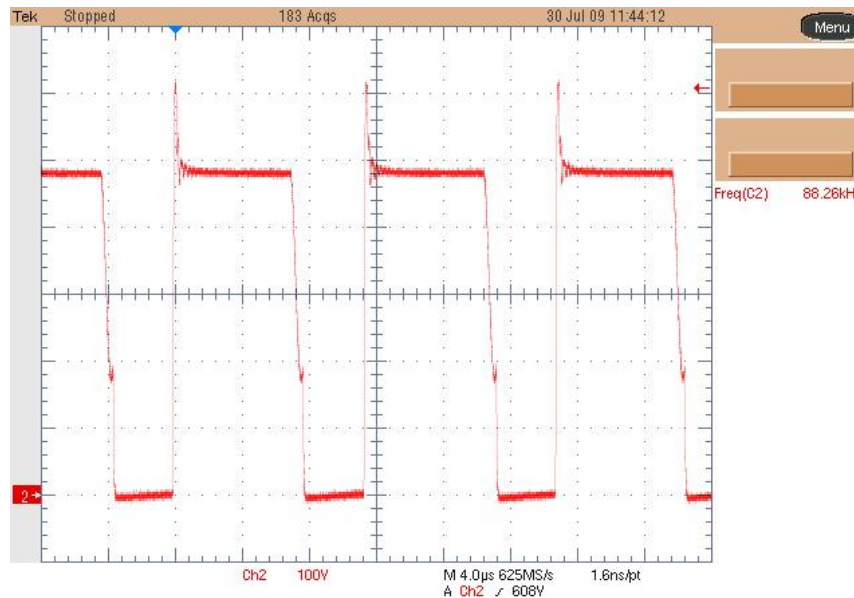
The output voltage transient response is shown in the plot below. The input was set to 230Vac and the load switched from 50% to 100% of the nominal load.

Channel 3: output voltage (2 V/div, ac coupled, 40ms/div), Channel 4: output current (0.5A/div)



## 7 Switching Node Waveform

The image below shows the voltage on the drain of the switching node, with a 230Vac input, and full load. Channel 2 shows the drain voltage (100V/div, 4us/div).

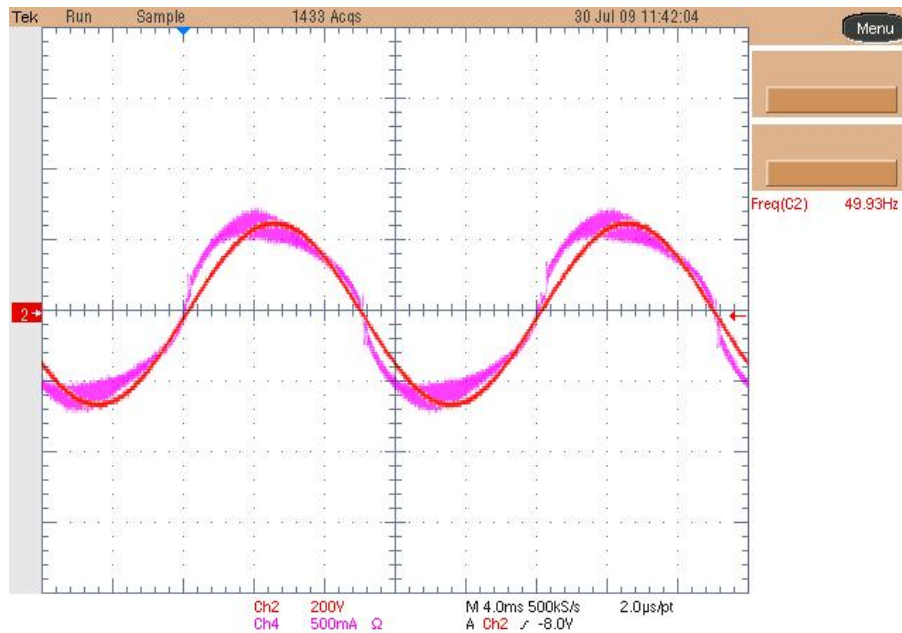


## 8 Input Voltage and Current Waveforms

The images below show the input voltage and current while the source was set to the three different input voltages and the converter was fully loaded.

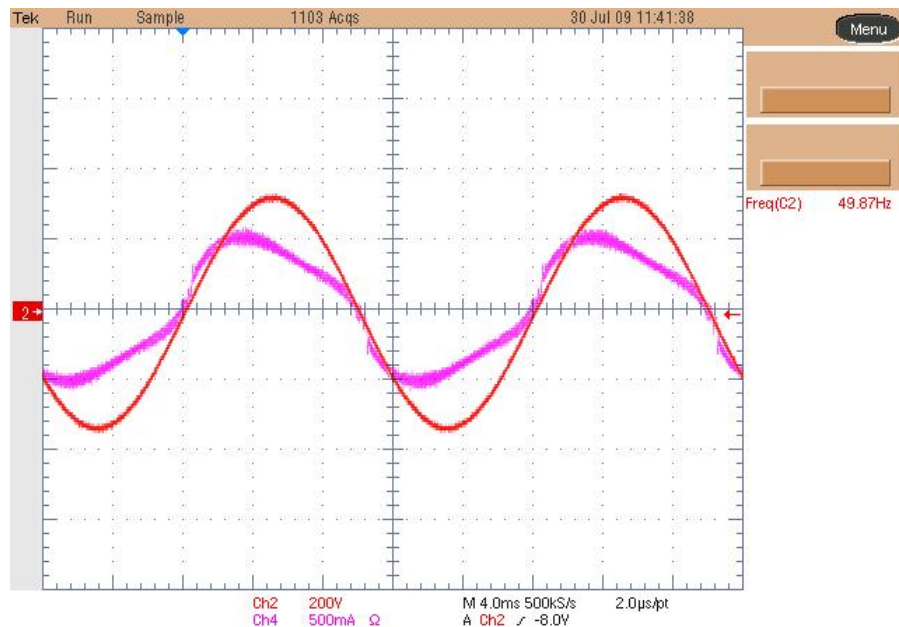
$V_{in} = 180 \text{ Vrms}$

Channel 2: input voltage (200V/div, 4ms/div); Channel 4: input current (500mA/div)



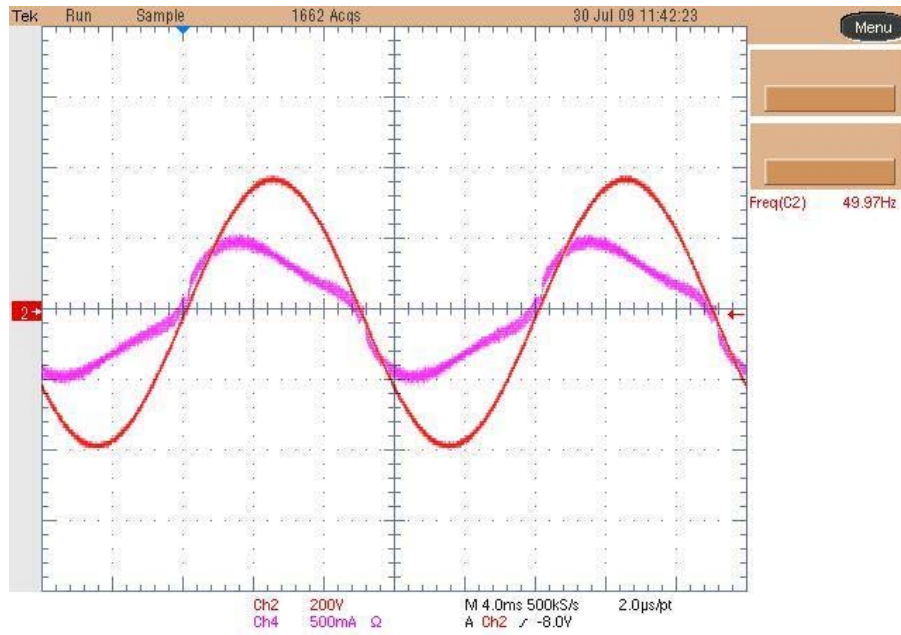
$V_{in} = 230 \text{ Vrms}$

Channel 2: input voltage (200V/div, 4ms/div); Channel 4: input current (500mA/div)



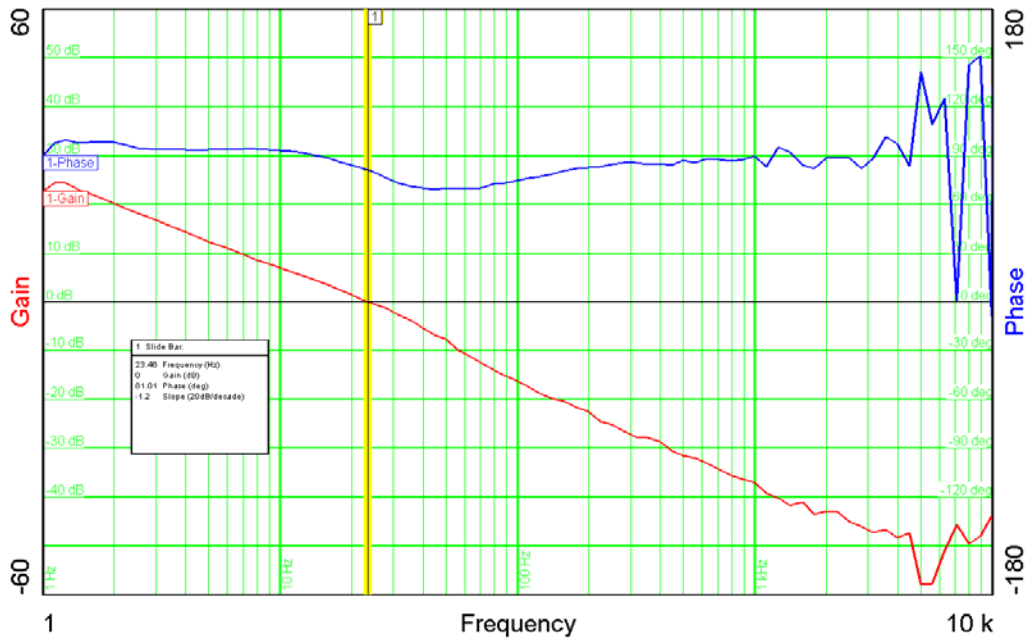
Vin = 265 Vrms

Channel 2: input voltage (200V/div, 4ms/div); Channel 4: input current (500mA/div)



## 9 Loop Response

The image below shows the loop response of the converter measured with a 320Vdc input, with 1.4A load. Phase margin is 81 deg. and crossover frequency is 23.46 Hz.



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