

**Efficiency**

**VFO MODE:**

		PoE Input Efficiency			AUX Input Efficiency			Converter Only Efficiency		
		J1	J1	J1	J3	J3	J3	VDD	VDD	VDD
<u>I<sub>out</sub></u>	<u>V<sub>out</sub></u>	<u>I<sub>lin</sub></u>	<u>V<sub>in</sub></u>	<u>Eff</u>	<u>I<sub>lin</sub></u>	<u>V<sub>in</sub></u>	<u>Eff</u>	<u>I<sub>lin</sub></u>	<u>V<sub>in</sub></u>	<u>Eff</u>
0.000	12.19	0.0025	48.0	0.0%	0.0031	48.0	0.0%	0.0031	47.73	0.0%
0.025	12.19	0.0098	48.0	64.8%	0.0105	48.0	60.5%	0.0105	47.70	60.8%
0.050	12.19	0.0172	48.0	73.8%	0.0175	48.0	72.6%	0.0175	47.67	73.1%
0.075	12.19	0.0242	48.0	78.7%	0.0247	48.0	77.1%	0.0247	47.66	77.7%
0.100	12.19	0.0316	48.0	80.4%	0.0321	48.0	79.1%	0.0321	47.65	79.7%
0.125	12.19	0.0387	48.0	82.0%	0.0391	48.0	81.2%	0.0391	47.64	81.8%
0.150	12.19	0.0461	48.0	82.6%	0.0464	48.0	82.1%	0.0464	47.64	82.7%
0.175	12.19	0.0536	48.0	82.9%	0.0538	48.0	82.6%	0.0538	47.63	83.2%
0.200	12.19	0.0612	48.0	83.0%	0.0614	48.0	82.7%	0.0614	47.62	83.4%
0.225	12.19	0.0680	48.0	84.0%	0.0681	48.0	83.9%	0.0681	47.62	84.6%
0.250	12.19	0.0750	48.0	84.7%	0.0750	48.0	84.7%	0.0750	47.62	85.3%
0.300	12.19	0.0896	48.0	85.0%	0.0893	48.0	85.3%	0.0893	47.61	86.0%
0.400	12.19	0.1194	48.0	85.1%	0.1190	48.0	85.4%	0.1190	47.58	86.1%
0.500	12.19	0.1486	48.0	85.5%	0.1478	48.0	85.9%	0.1478	47.55	86.7%
0.600	12.19	0.1793	48.0	85.0%	0.1777	48.0	85.7%	0.1777	47.55	86.6%
0.700	12.19	0.2061	48.0	86.3%	0.2035	48.0	87.4%	0.2035	47.53	88.2%
<b>3.6W Input</b>										
Increasing output current: VFO mode to PWM mode at I <sub>out</sub> =720mA										

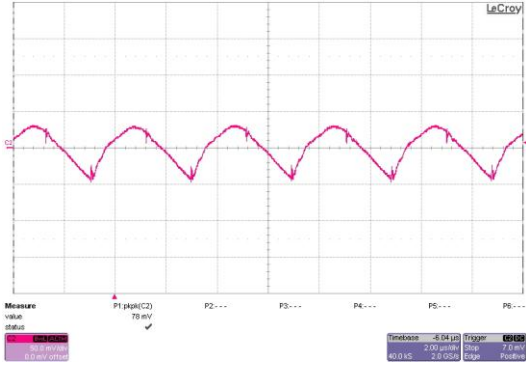
**PWM MODE:**

		PoE Input Efficiency			AUX Input Efficiency			Converter Only Efficiency		
		J1	J1	J1	J3	J3	J3	VDD	VDD	VDD
<u>I<sub>out</sub></u>	<u>V<sub>out</sub></u>	<u>I<sub>lin</sub></u>	<u>V<sub>in</sub></u>	<u>Eff</u>	<u>I<sub>lin</sub></u>	<u>V<sub>in</sub></u>	<u>Eff</u>	<u>I<sub>lin</sub></u>	<u>V<sub>in</sub></u>	<u>Eff</u>
0.400	12.19	0.142	48.0	71.5%	0.141	48.0	72.0%	0.141	47.58	72.7%
0.500	12.19	0.168	48.0	75.6%	0.167	48.0	76.0%	0.167	47.56	76.7%
0.600	12.19	0.194	48.0	78.5%	0.193	48.0	79.0%	0.193	47.55	79.7%
0.750	12.19	0.233	48.0	81.7%	0.231	48.0	82.5%	0.231	47.54	83.3%
1.00	12.19	0.299	48.0	84.9%	0.296	48.0	85.8%	0.296	47.50	86.7%
1.25	12.19	0.366	48.0	86.7%	0.361	48.0	87.9%	0.361	47.47	88.9%
1.50	12.19	0.433	48.0	88.0%	0.427	48.0	89.2%	0.427	47.44	90.3%
1.75	12.19	0.502	48.0	88.5%	0.493	48.0	90.1%	0.493	47.40	91.3%
1.82	12.19	0.521	48.0	88.7%	0.521	48.0	88.7%	0.521	47.40	89.8%
2.00	12.19	0.571	48.0	89.0%	0.560	48.0	90.7%	0.560	47.37	91.9%
2.10	12.19	0.598	48.0	89.2%	0.587	48.0	90.9%	0.587	47.37	92.1%
<b>25W Input</b>										
Decreasing output current: PWM mode to VFO mode at I <sub>out</sub> =310mA										

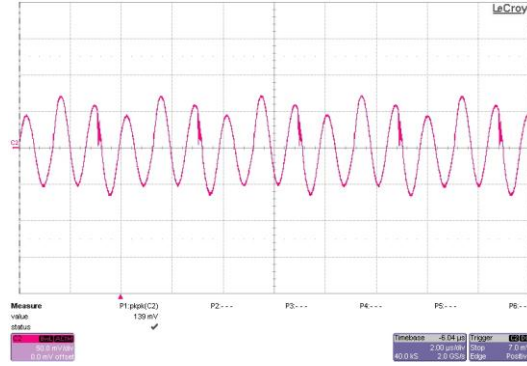
**Ripple and Noise**

Ripple measurements taken with 48VIN at J1 and 20MHz BWL.

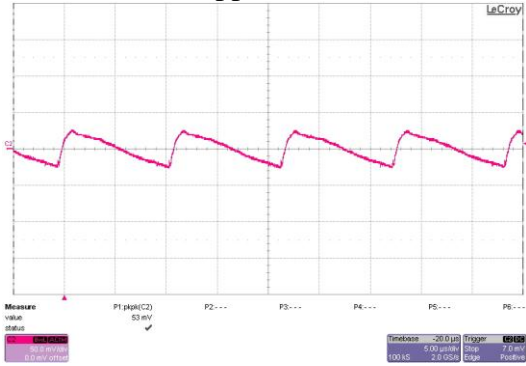
Output Ripple (C24), 2A load  
50mV/div, 2us/div  
Measured 78mVpp:



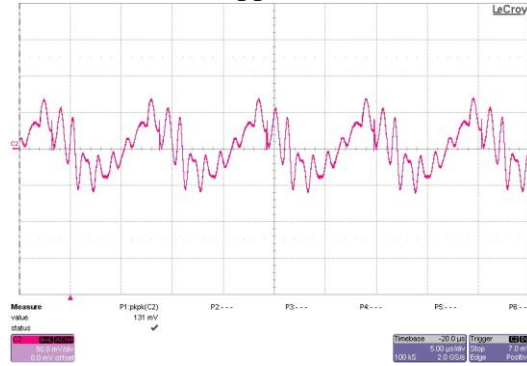
Input Ripple (FB1/FB3), 2A load  
50mV/div, 2us/div  
Measured 139mVpp:



Output Ripple (C24), 250mA load  
50mV/div, 5us/div  
Measured 53mVpp:

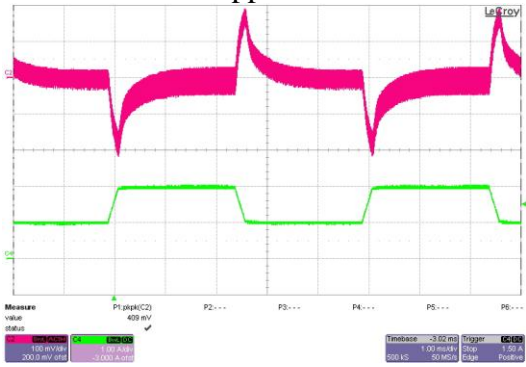


Input Ripple (FB1/FB3), 250mA load  
50mV/div, 5us/div  
Measured 131mVpp:



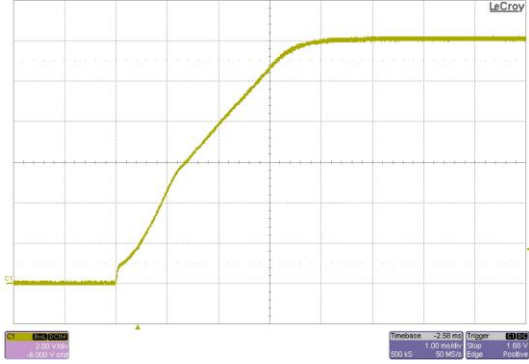
**Dynamic Loading**

Load Step, 1A to 2A, 100mV/div  
1msec/div, 5mA/usec slew rate  
Measured 409mVpp:

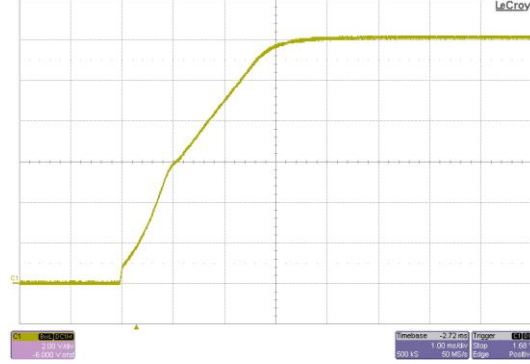


### Turn On Response

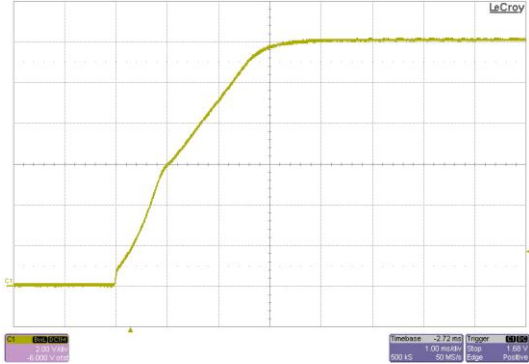
48VIN, 2A Load, 1msec/div:



48VIN, 250mA Load, 1msec/div:

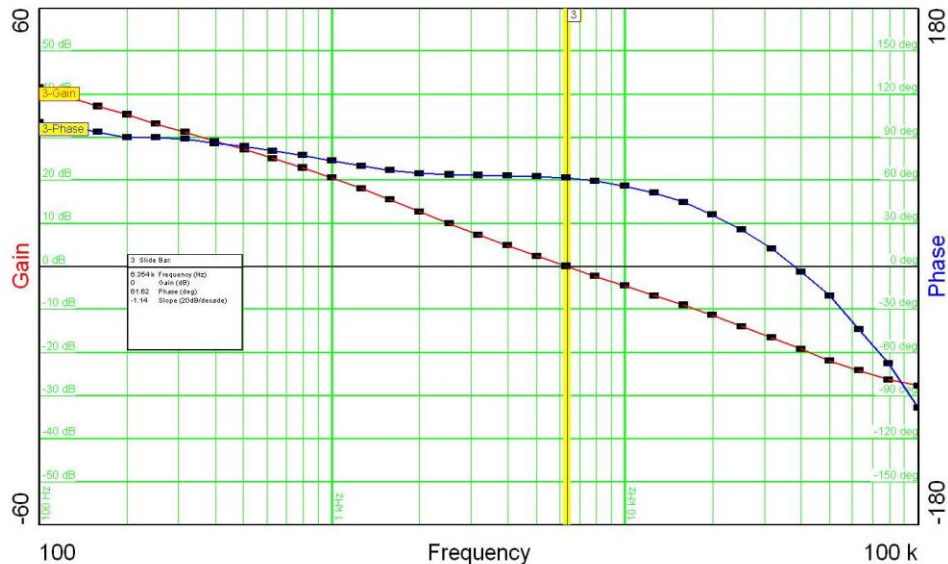


48VIN, 0A Load, 1msec/div:



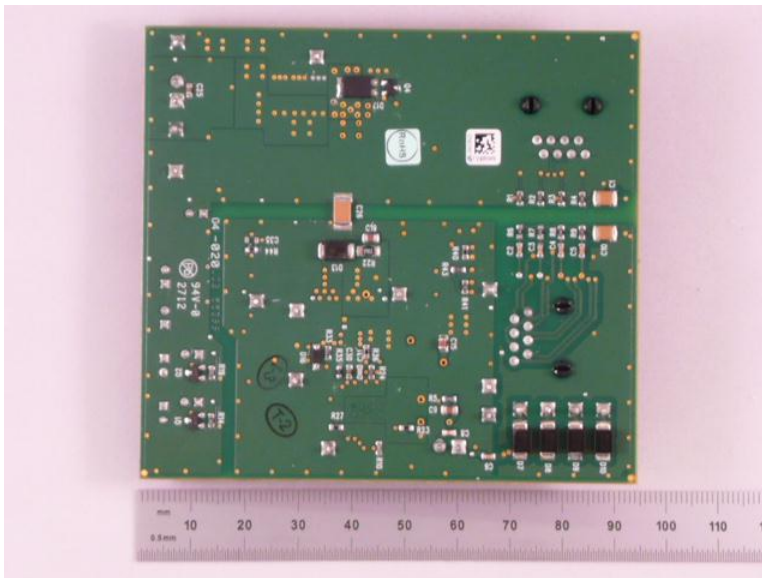
### Stability (Loop Gain)

The figure below is the loop gain of the converter with a 48V input and 2A load. The bandwidth is 6.3 KHz, the phase margin is 61 degrees, and the gain margin is 18 dB.



Photo

Converter is built on TPS23752EVM-145 PCB:



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