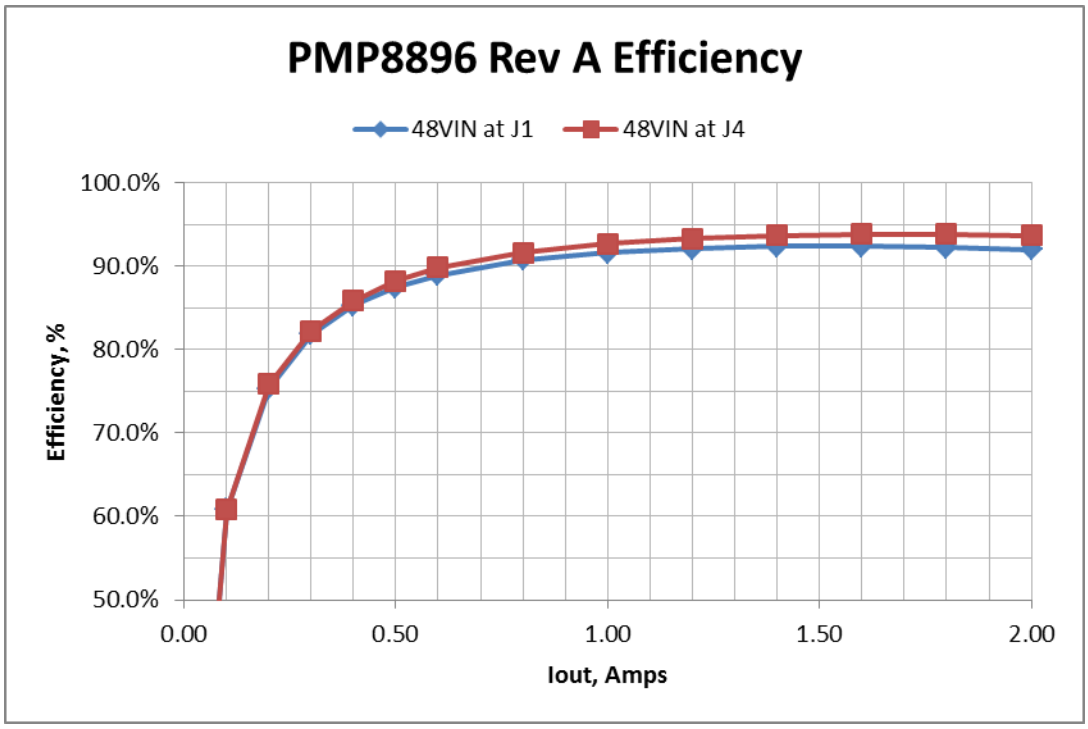
Efficiency

The efficiency of the converter is shown below:

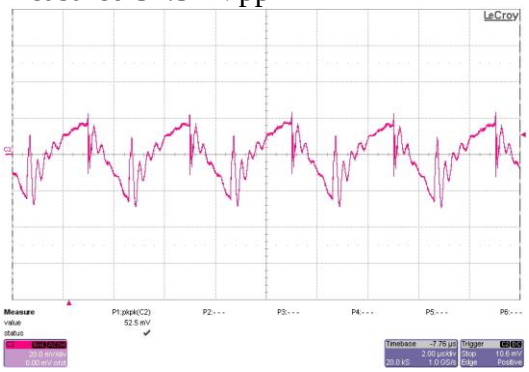
	TP5/TP6	J1	J1	J1	J4	J4	J4
Iout	Vout	Iin	Vin	Eff	Iin	Vin	Eff
0.00	4.989	0.0068	48.00	0.0%	0.0068	48.00	0.0%
0.10	4.989	0.0171	48.00	60.8%	0.0171	48.00	60.8%
0.20	4.989	0.0276	48.00	75.3%	0.0274	48.00	75.9%
0.30	4.989	0.0381	48.00	81.8%	0.0379	48.00	82.3%
0.40	4.988	0.0487	48.00	85.4%	0.0484	48.00	85.9%
0.50	4.988	0.0594	48.00	87.5%	0.0589	48.00	88.2%
0.60	4.988	0.0701	48.00	88.9%	0.0694	48.00	89.8%
0.80	4.988	0.0916	48.00	90.8%	0.0907	48.00	91.7%
1.00	4.988	0.1134	48.00	91.6%	0.1121	48.00	92.7%
1.20	4.988	0.1354	48.00	92.1%	0.1336	48.00	93.3%
1.40	4.988	0.1575	48.00	92.4%	0.1553	48.00	93.7%
1.60	4.988	0.1800	48.00	92.4%	0.1772	48.00	93.8%
1.80	4.988	0.2027	48.00	92.3%	0.1993	48.00	93.9%
2.00	4.988	0.2258	48.00	92.0%	0.2217	48.00	93.7%



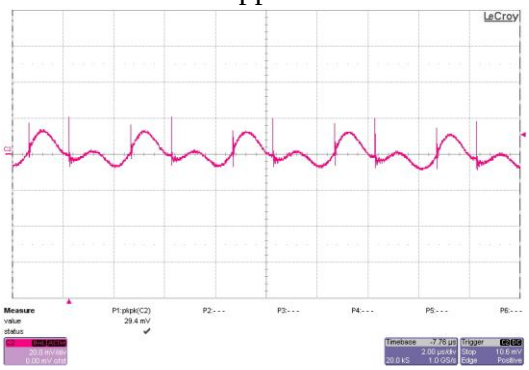
Ripple and Noise

Ripple measurements taken with 48VIN at J1, 2A load, and 20MHz BWL.

Output Ripple (C11), 20mV/div, 2us/div:
Measured 52.5mVpp

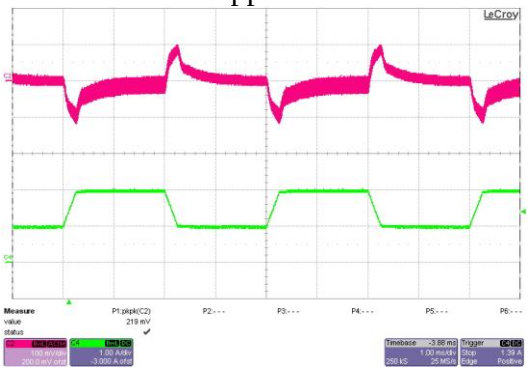


Input Ripple (J4), 20mV/div, 2us/div:
Measured 29.4mVpp

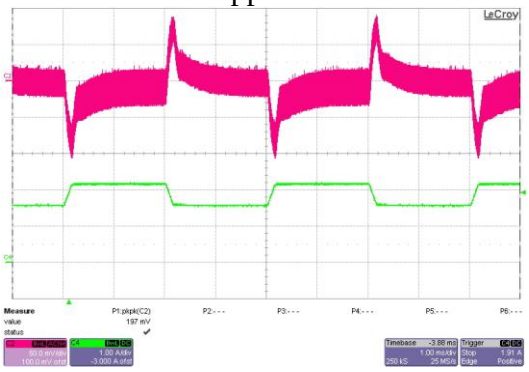


Dynamic Loading

Load Step, 1A to 2A, 100mV/div
1msec/div, 4mA/usec slew rate
Measured 219mVpp:



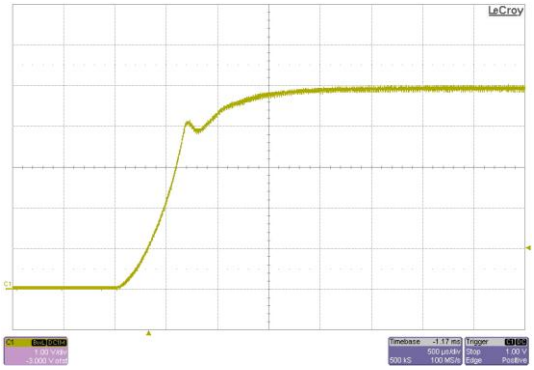
Load Step, 1.6A to 2.2A, 50mV/div
1msec/div, 4mA/usec slew rate
Measured 197mVpp:



Turn On Response

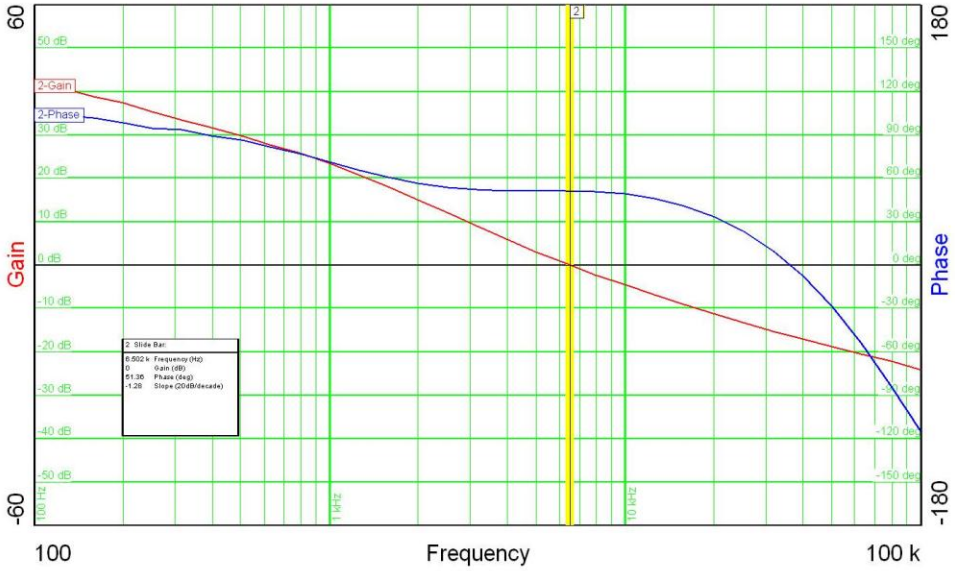
48VIN, 2A Load, 500usec/div:

48VIN, 0A Load, 500usec.div:



Stability (Loop Gain)

The figure below is the loop gain of the converter with a 48V input and 2A load. The bandwidth is 6.5 KHz, the phase margin is 51 degrees, and the gain margin is 16 dB.



IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale (https:www.ti.com/legal/termsofsale.html) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2021, Texas Instruments Incorporated