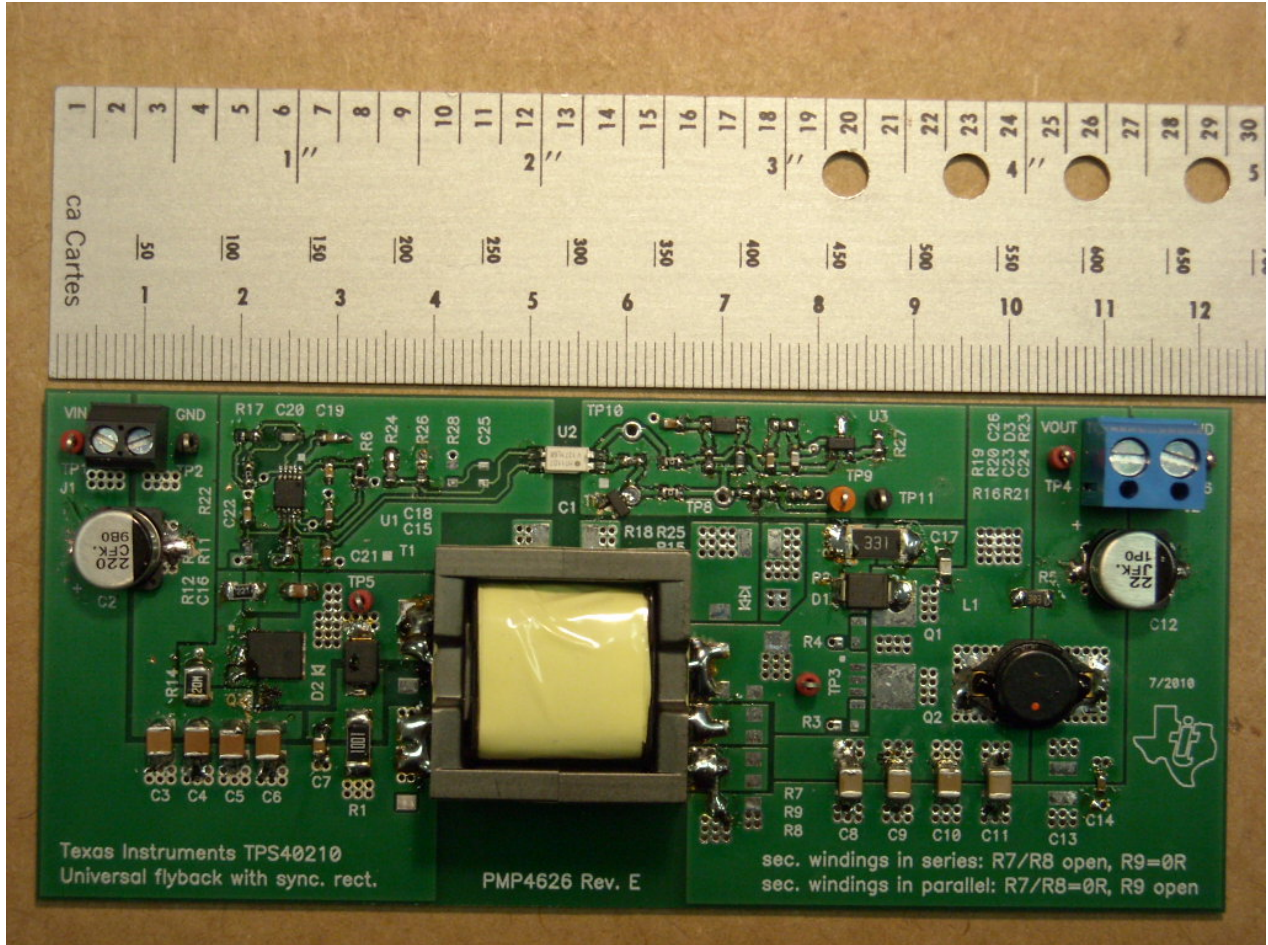


Photo of the prototype

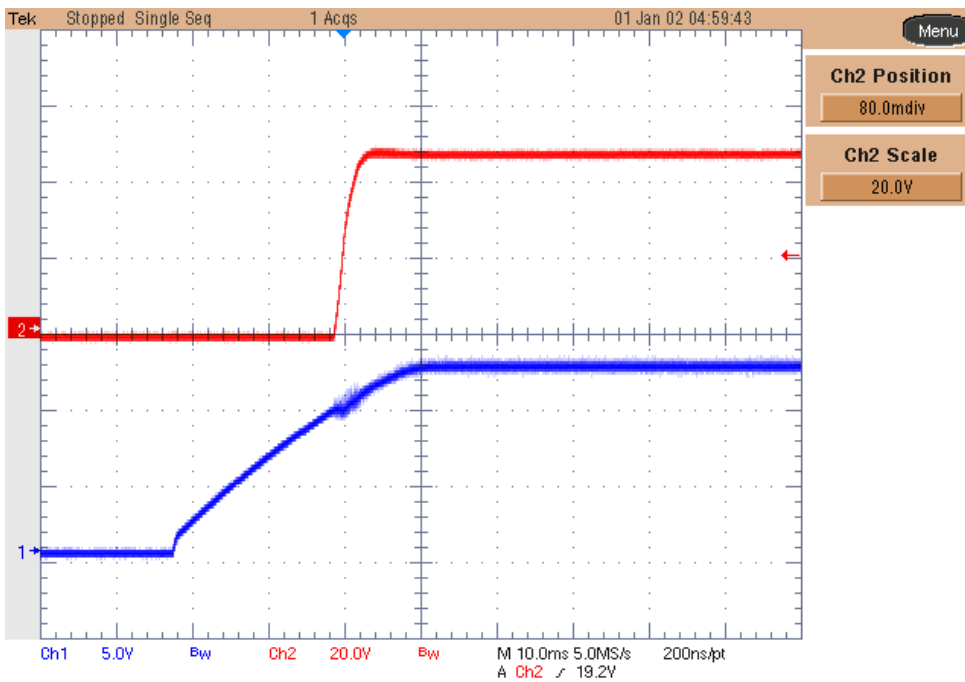
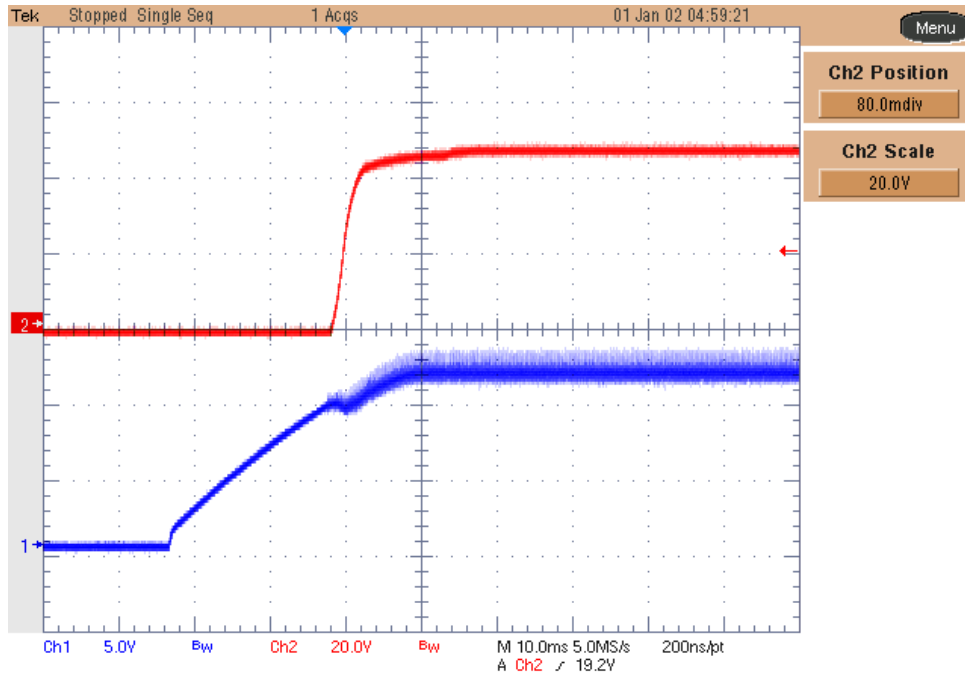


1 Startup

The output and input voltages at startup are shown in the images below. The input voltage was set to 12V. The load was set to full power (upper picture) and no power (lower picture).

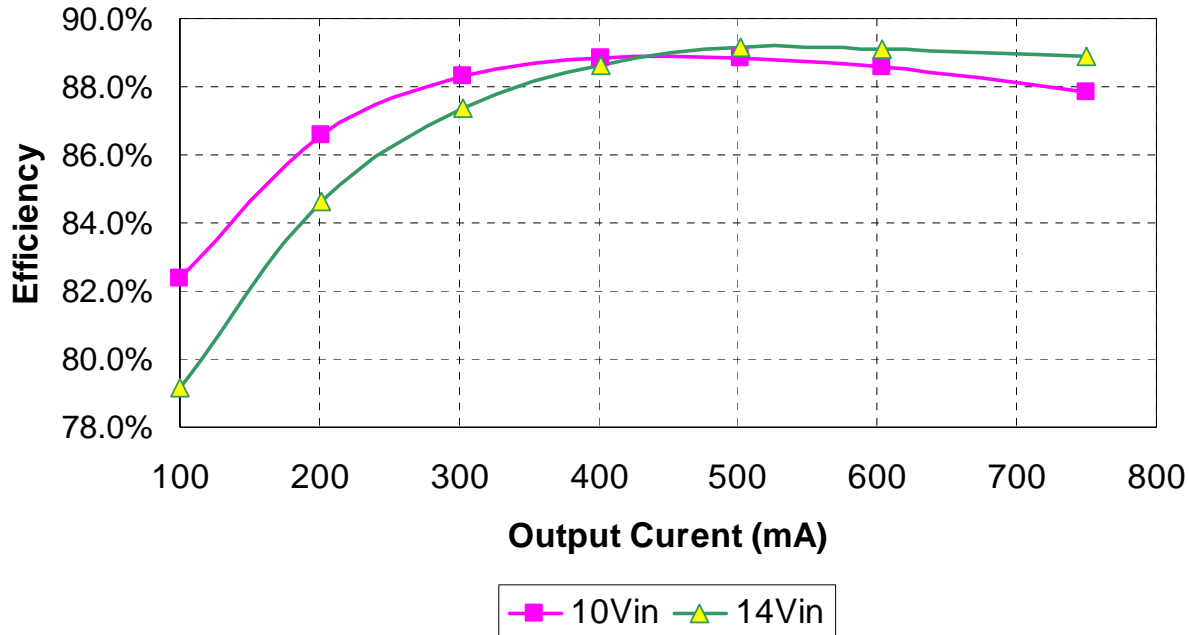
Channel 2: Output Voltage (20 V/div, 10msec/div, 20MHz BWL).

Channel 1: Input Voltage (5 V/div, 20MHz BWL).



1. Efficiency

The efficiency data is shown in the tables and graph below.
The measurements were taken at 10V_{in} and 14V_{in}.

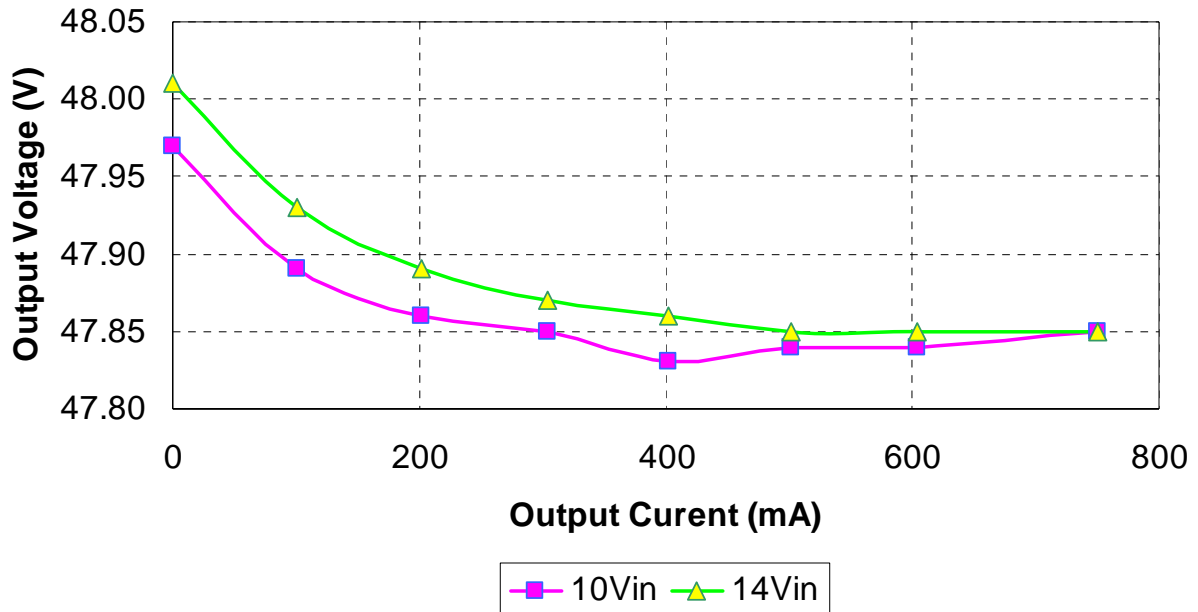


I _{out} (mA)	V _{out} (V)	P _{out} (W)	I _{in} (mA)	V _{in} (V)	P _{in} (W)	P _{loss} (W)	Eff. (%)
0.0	47.97	0.00	48.7	10.014	0.49	0.49	0.0%
100.4	47.89	4.81	580.4	10.060	5.84	1.03	82.3%
201.8	47.86	9.66	1114	10.021	11.16	1.50	86.6%
303.4	47.85	14.52	1641	10.017	16.44	1.92	88.3%
402.3	47.83	19.24	2164	10.007	21.66	2.41	88.9%
501.6	47.84	24.00	2701	10.003	27.02	3.02	88.8%
603.2	47.84	28.86	3256	10.007	32.58	3.73	88.6%
750.3	47.85	35.90	4087	10.002	40.88	4.98	87.8%

I _{out} (mA)	V _{out} (V)	P _{out} (W)	I _{in} (mA)	V _{in} (V)	P _{in} (W)	P _{loss} (W)	Eff. (%)
0.0	48.01	0.00	42.0	14.00	0.59	0.59	0.0%
100.4	47.93	4.81	434.0	14.01	6.08	1.27	79.1%
201.8	47.89	9.66	815	14.01	11.42	1.75	84.6%
303.4	47.87	14.52	1186	14.02	16.63	2.10	87.3%
402.3	47.86	19.25	1552	14.00	21.73	2.47	88.6%
501.5	47.85	24.00	1923	14.00	26.92	2.93	89.1%
603.2	47.85	28.86	2312	14.01	32.39	3.53	89.1%
750.2	47.85	35.90	2883	14.01	40.39	4.49	88.9%

2. Output Voltage Regulation

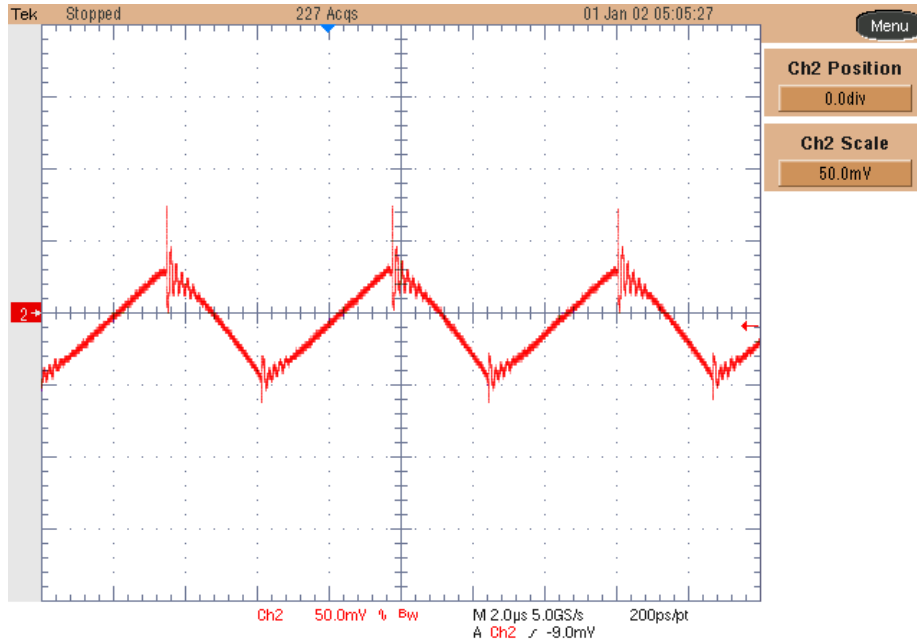
The output voltage regulation versus load at 10V and 14V input voltage is shown in the graph below.



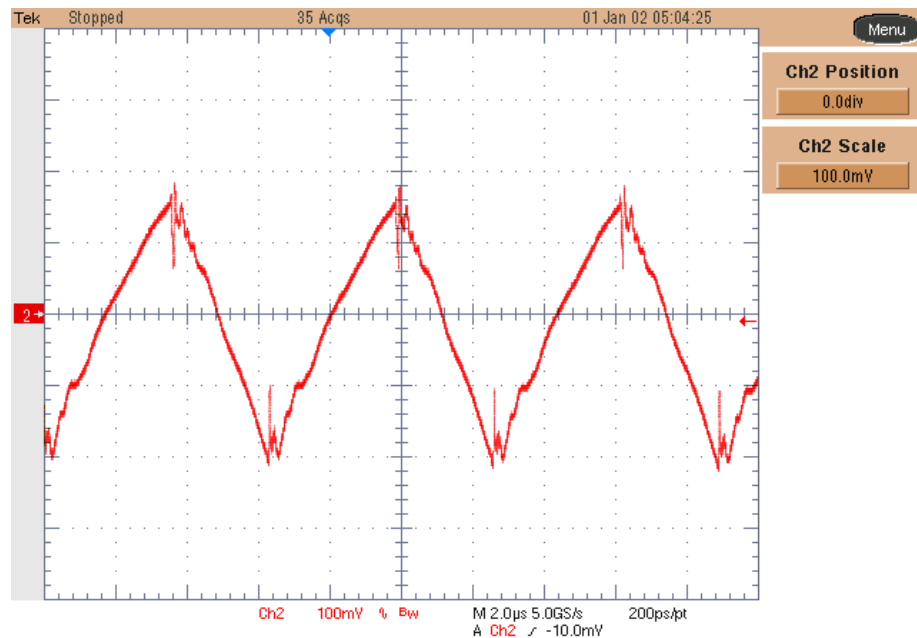
3. Input and Output Ripple Voltage

The ripple voltage waveforms measured at the terminal blocks are shown in the plots below. The input was set to 12V and the output fully loaded.

Channel 2: Output Ripple Voltage (50 mV/div, 2usec/div, AC coupled, 20MHz BW limit).



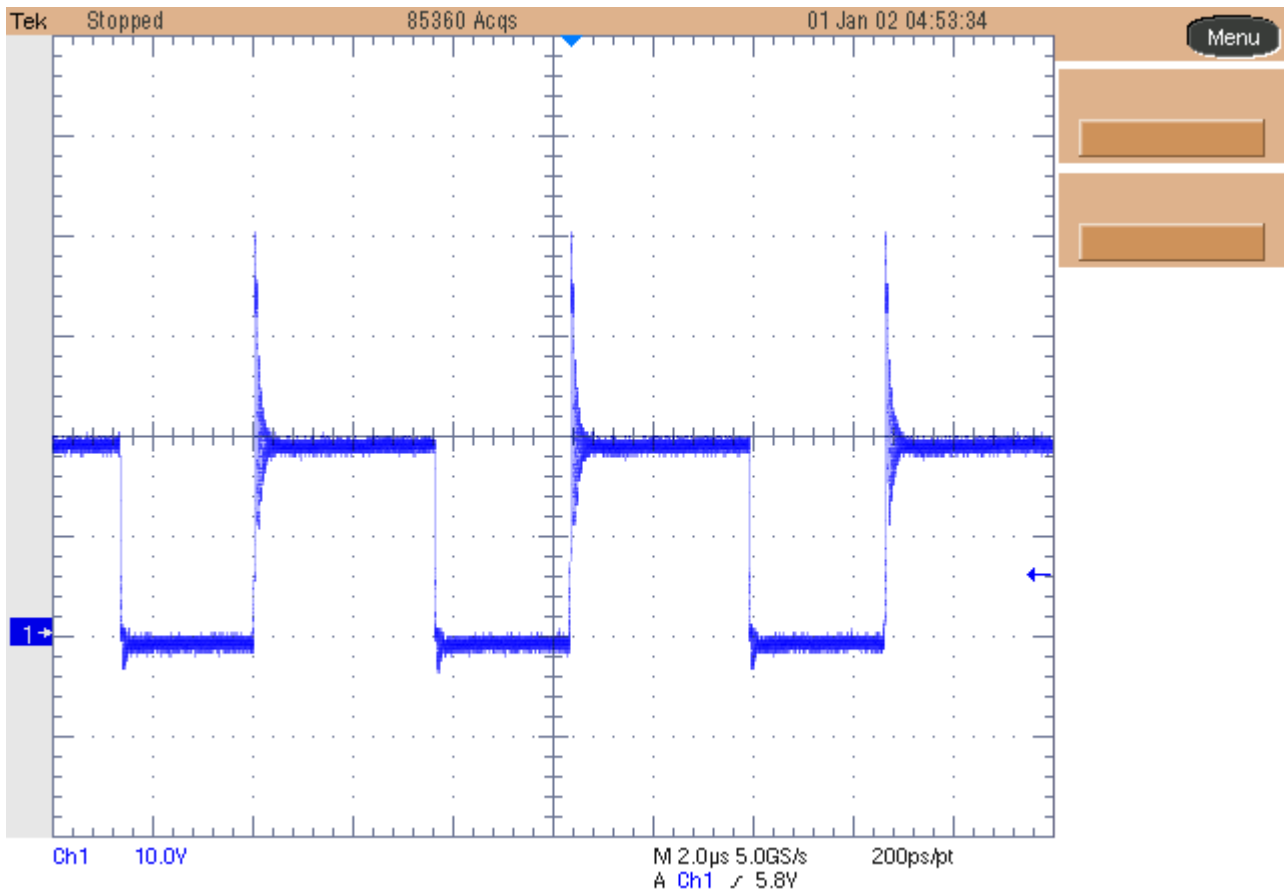
Channel 2: Input Ripple Voltage (100 mV/div, 2usec/div, AC coupled, 20MHz BW limit).



4. Switching Waveforms

The image below shows the drain-to-source waveforms of the power MOSFETs at full load.

Channel 2: “Q13 Vds”, (10V/div, 1usec/div), no bandwidth reduction, @ 12Vin

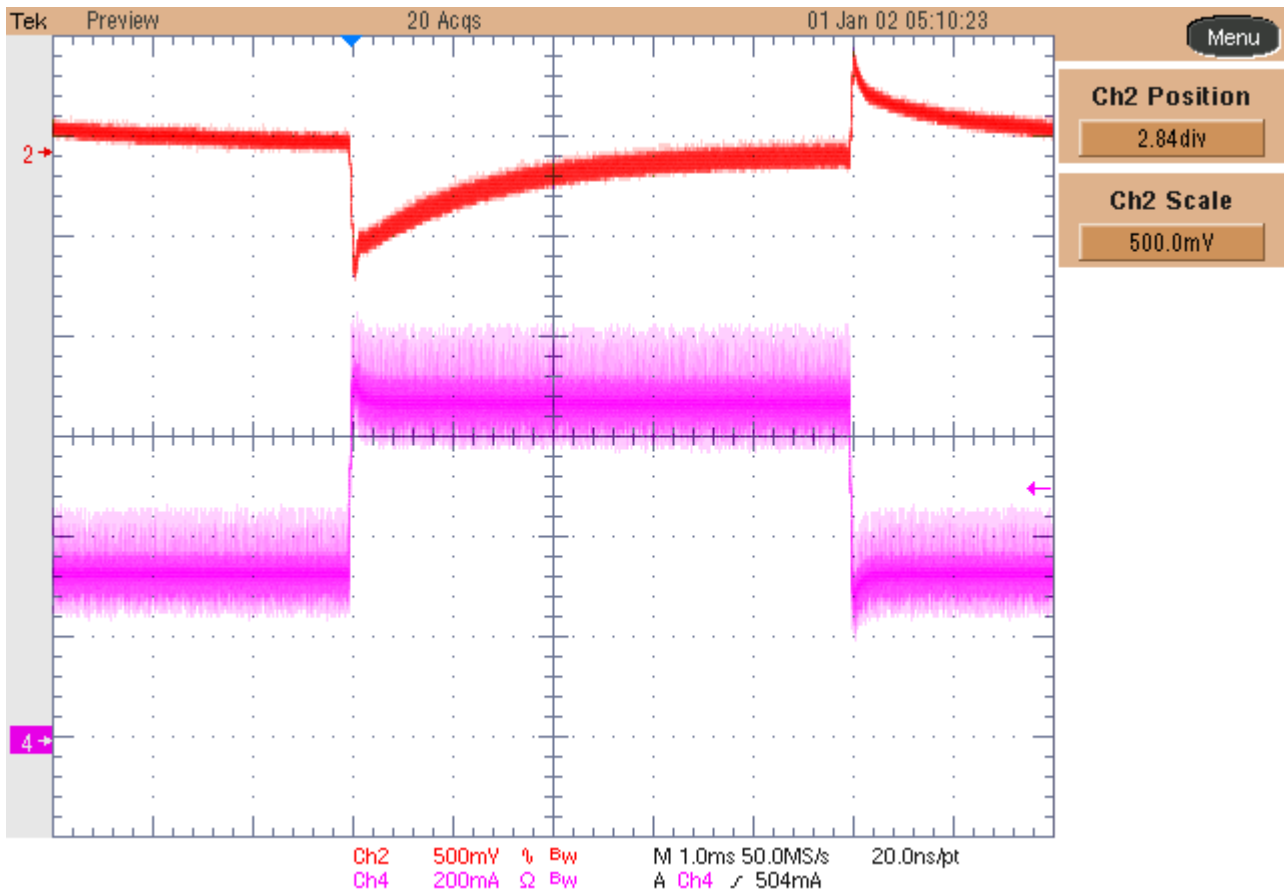


5. Transient Response

The image below shows the transient response behavior. The input voltage was set to the nominal voltage (12V) and the load switched between 50% and 100% of the nominal value.

Channel 2: Output Voltage (500mV/div, AC coupled, 1msec/div, 20MHz BWL)

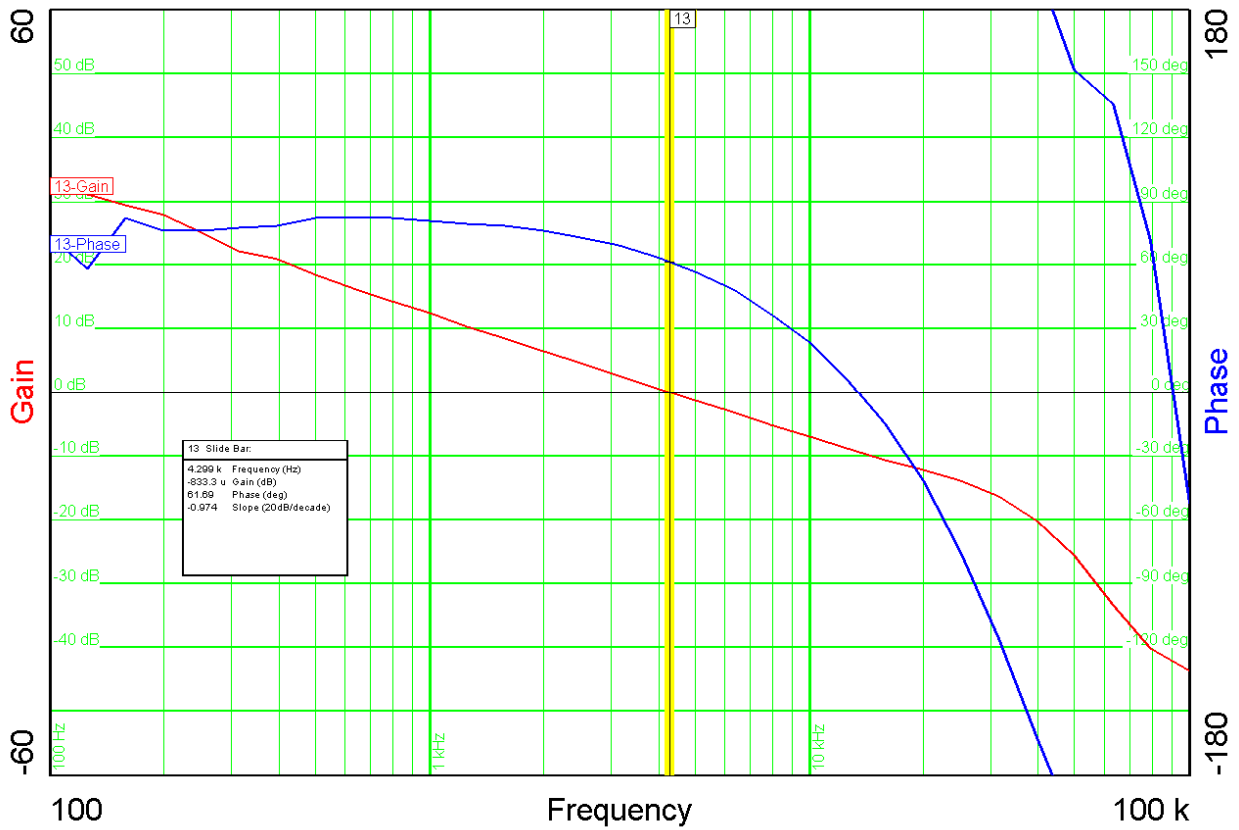
Channel 4: Switched current on the output (200mA/div, DC coupled, 20MHz BWL)



6. Loop Analysis

The graph below shows the loop measurement at 12Vin and full load.

The crossover frequency was 4.3 KHz and the phase margin 61.7deg, while the gain margin was 9.3dB.



7. Thermal Analysis

The image and table below describe the thermal behavior of the board, supplied with 12in and fully loaded. The thermal shot has been taken 20 minutes after power on.

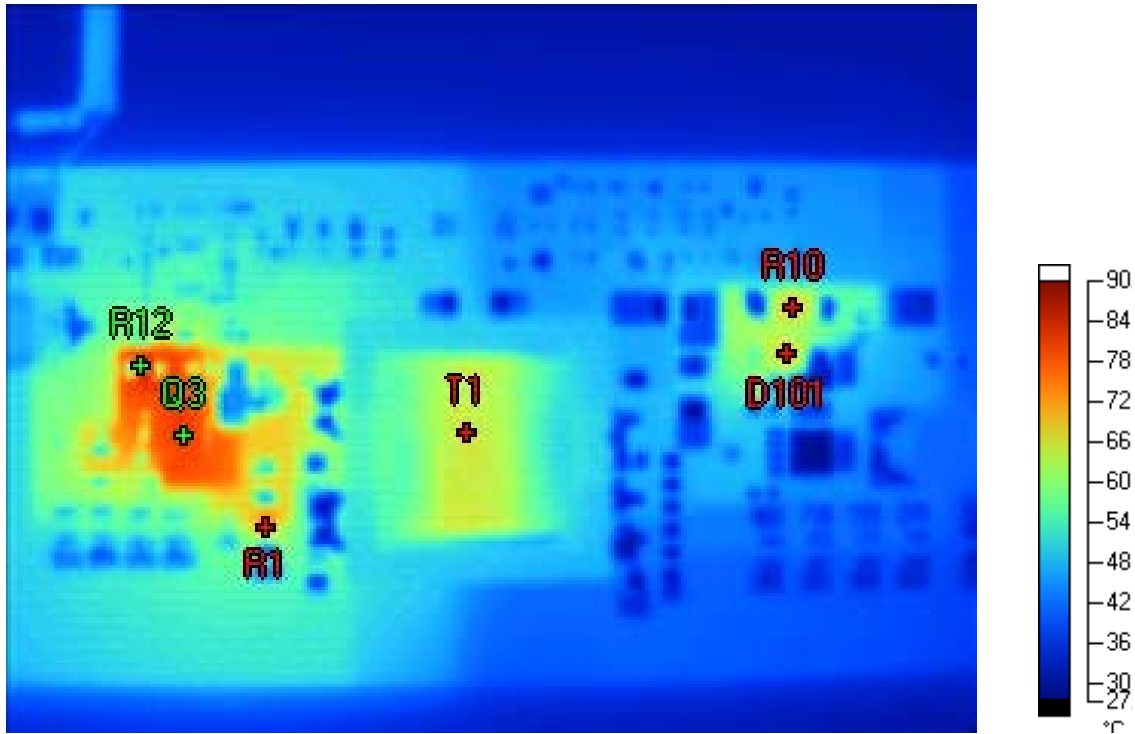


Image Info

Average Temperature	44.6 °C
Calibration Range	-20.0 °C to 350.0 °C
Camera Model	Ti40FT
Image Range	28.5 °C to 90.7 °C
Image Time	9/21/2012 4:11:45 PM
Lens Serial #	40948-4409
Manufacturer	Fluke
Camera Serial Number	Ti40FT-070263

Markers

Label	Temperature	Emissivity	Background
R12	87.1 °C	0.95	25.0 °C
Q3	81.0 °C	0.95	25.0 °C
T1	65.1 °C	0.95	25.0 °C
R1	71.9 °C	0.95	25.0 °C
R10	66.6 °C	0.95	25.0 °C
D101	66.3 °C	0.95	25.0 °C

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