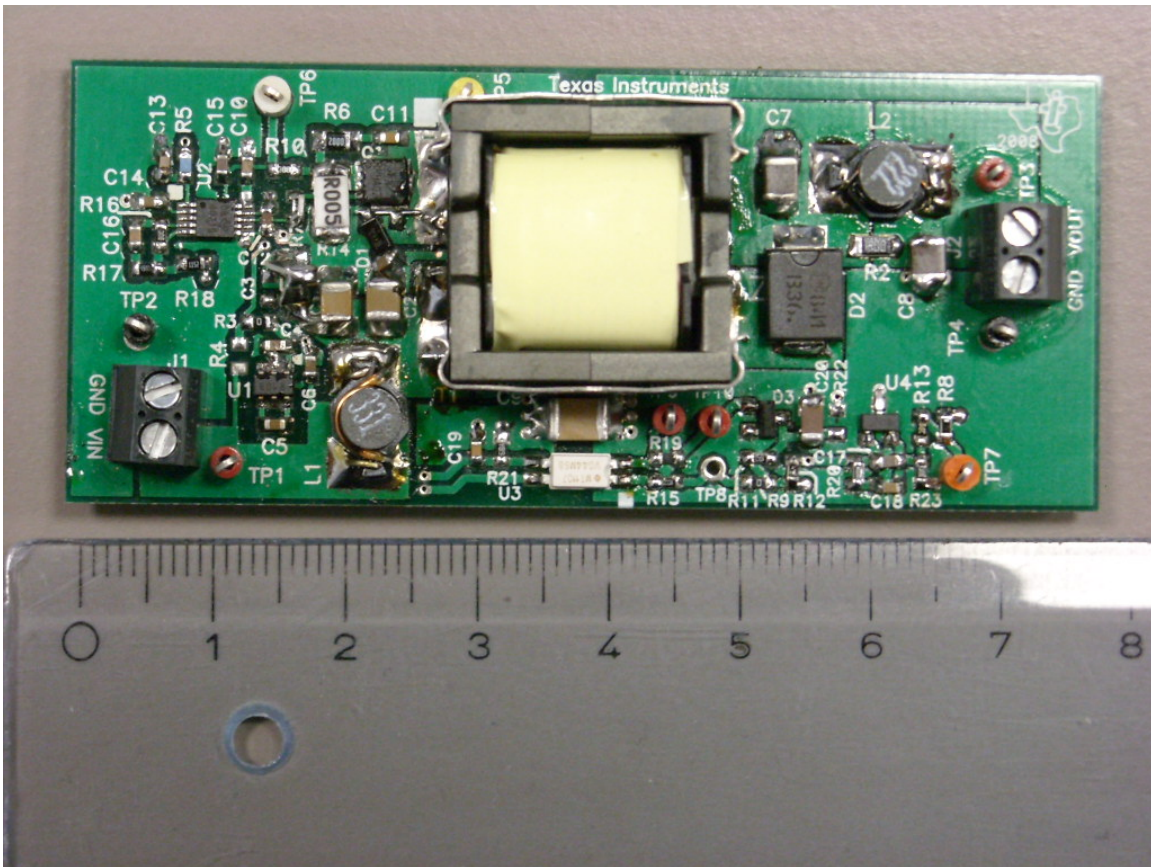


Photo of the prototype

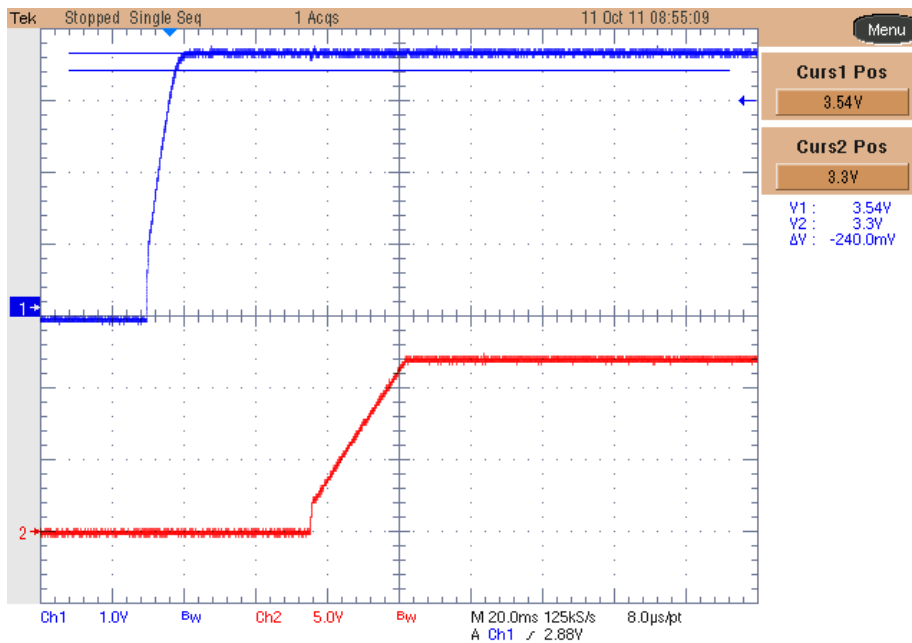
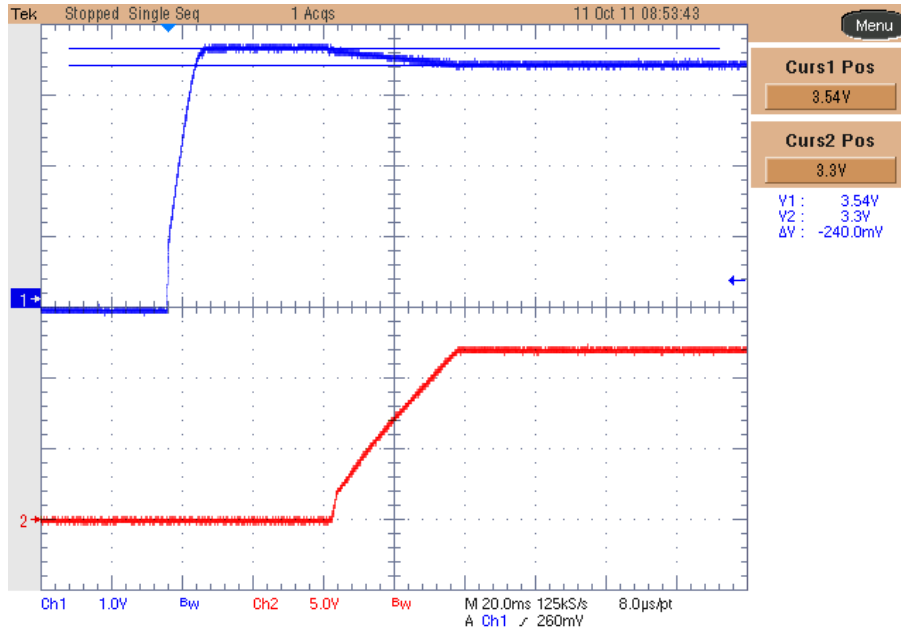


1. Startup

The input and output voltage waveforms at startup are shown in the images below. The input voltage has been set at 3.3V. The output was loaded with 1A constant current for the upper picture and with no load for the lower one.

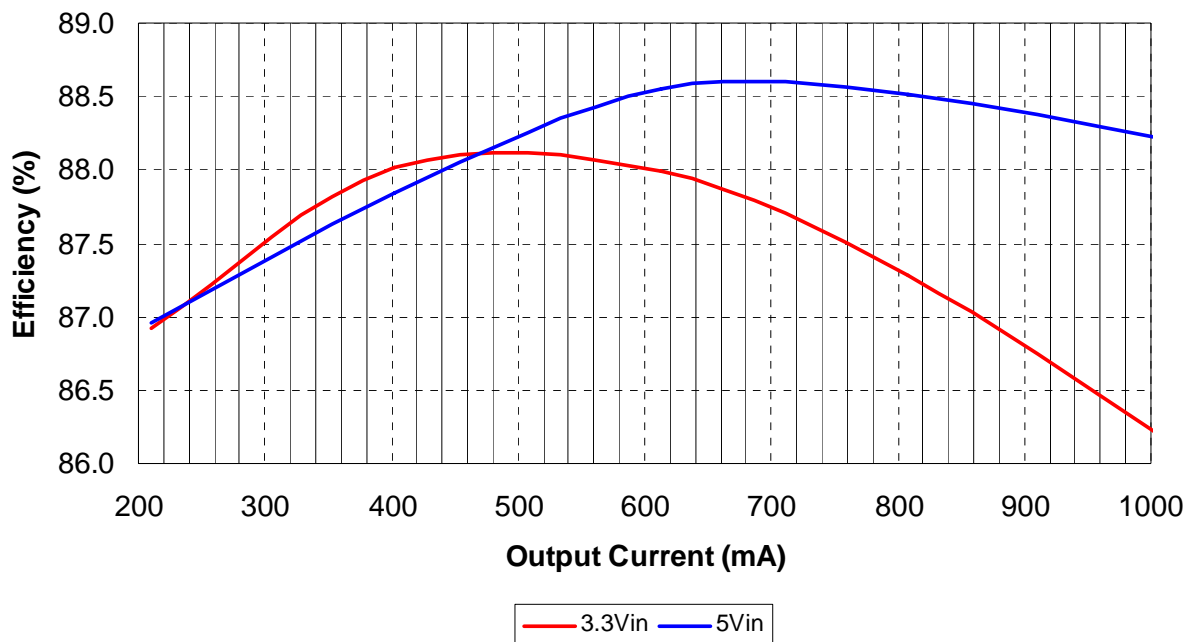
Channel 1: Input voltage (1 V/div, 20ms/div, 20MHz BWL).

Channel 2: Output Voltage (5V/div, 20MHz BWL).



2. Efficiency

The efficiency data versus output current is shown in the tables and graph below. The converter has been tested at 3.3V_{in} and 5V_{in}.

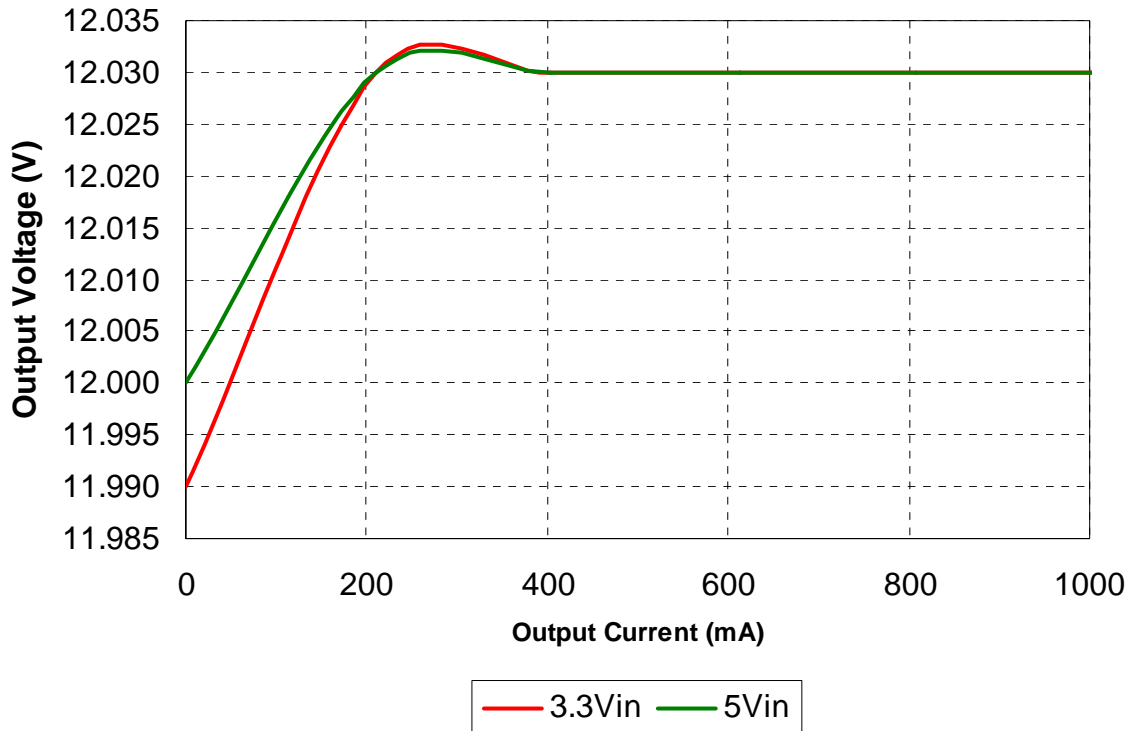


I _{out} (mA)	V _{out} (V _{dc})	I _{in} (mA)	V _{in} (V _{dc})	P _{out} (W)	P _{in} (W)	P _{loss} (W)	Eff (%)
0.0	11.99	24.6	3.311	0.00	0.081	0.08	0.0
210.2	12.03	880.5	3.304	2.53	2.909	0.38	86.92
402.4	12.03	1658	3.317	4.84	5.500	0.66	88.02
613.1	12.03	2533	3.309	7.38	8.382	1.01	88.00
807.3	12.03	3371	3.301	9.71	11.128	1.42	87.28
1014.5	12.03	4288	3.304	12.20	14.168	1.96	86.14

I _{out} (mA)	V _{out} (V _{dc})	I _{in} (mA)	V _{in} (V _{dc})	P _{out} (W)	P _{in} (W)	P _{loss} (W)	Eff (%)
0.0	12.00	18.9	5.014	0.00	0.095	0.09	0.0
210.2	12.03	581	5.005	2.53	2.908	0.38	86.96
402.4	12.03	1100.8	5.006	4.84	5.511	0.67	87.85
613.2	12.03	1665	5.003	7.38	8.330	0.95	88.56
807.3	12.03	2189	5.012	9.71	10.971	1.26	88.52
1014.5	12.03	2764	5.006	12.20	13.837	1.63	88.20

3. Output voltage regulation

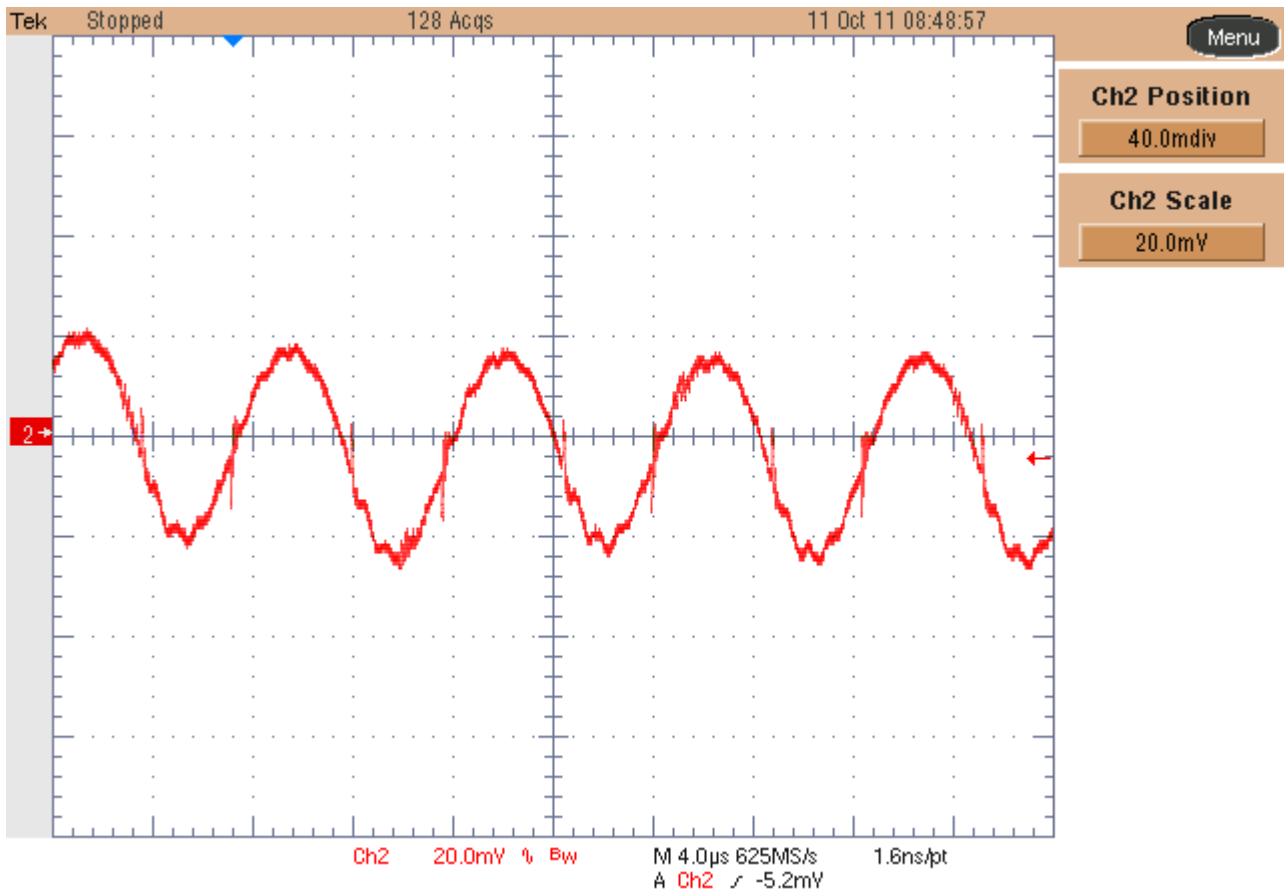
The output voltage versus output current is plotted below. The two curves @ 3.3V_{in} and 5V_{in} are coincident between 200mA and 1A load.



4. Output ripple voltage

The output ripple voltage plot is shown below. The input voltage was set at 3.3V and the output fully loaded.

Channel 2: Output Voltage (20mV/div, 4us/div, 20MHz BWL, AC coupling).

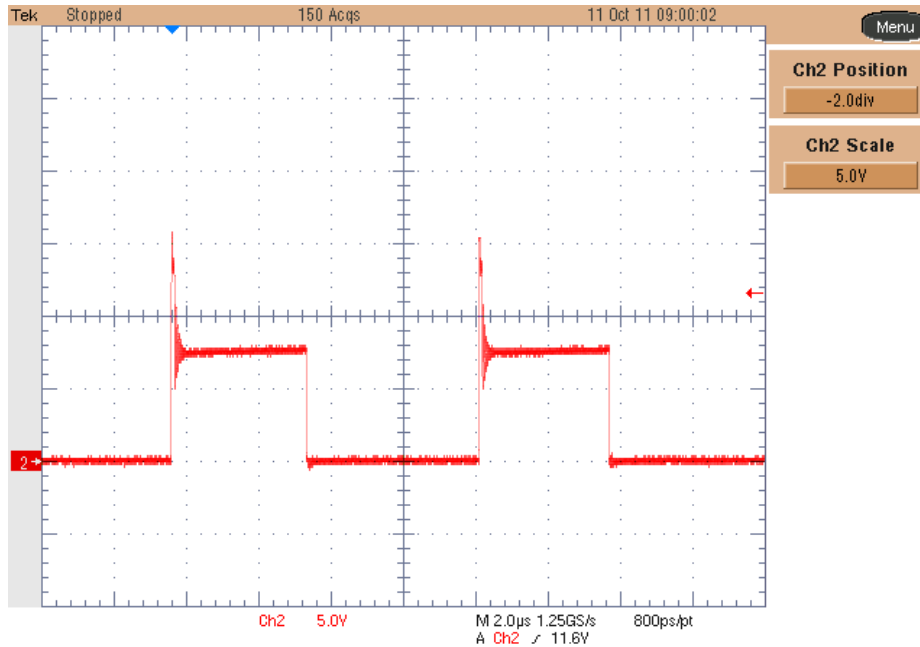


5. Switching Node Waveform: Q1 drain

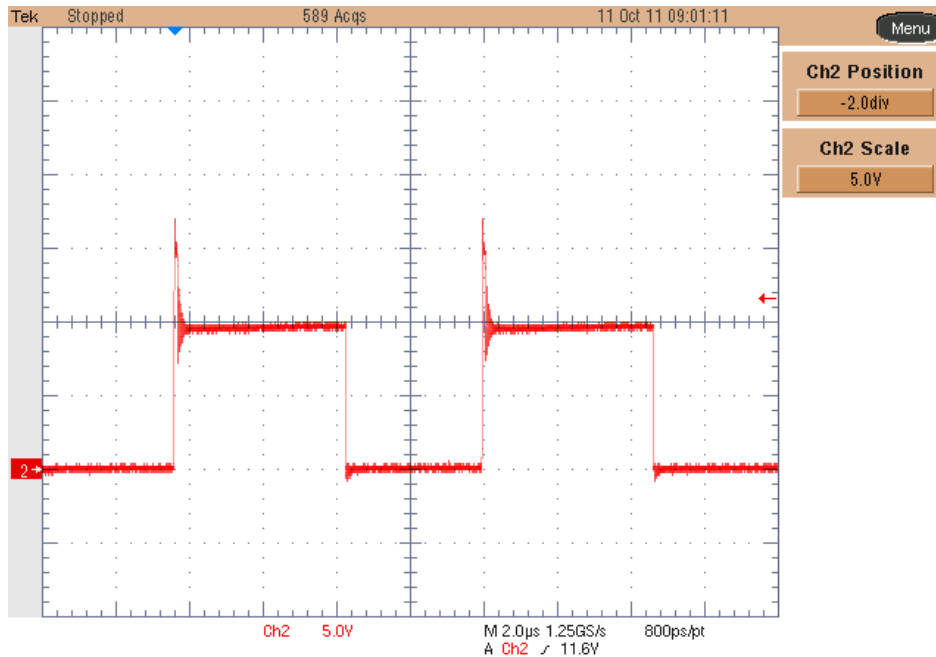
The images below show the voltage on the drain of the switching node with a respectively 3.3V and 5V input voltage, while the load was 1A.

Channel 2: Voltage on Q1 Mosfet's drain (5V/div, 2us/div, no BWL).

V_{in}=3.3V



V_{in}=5V

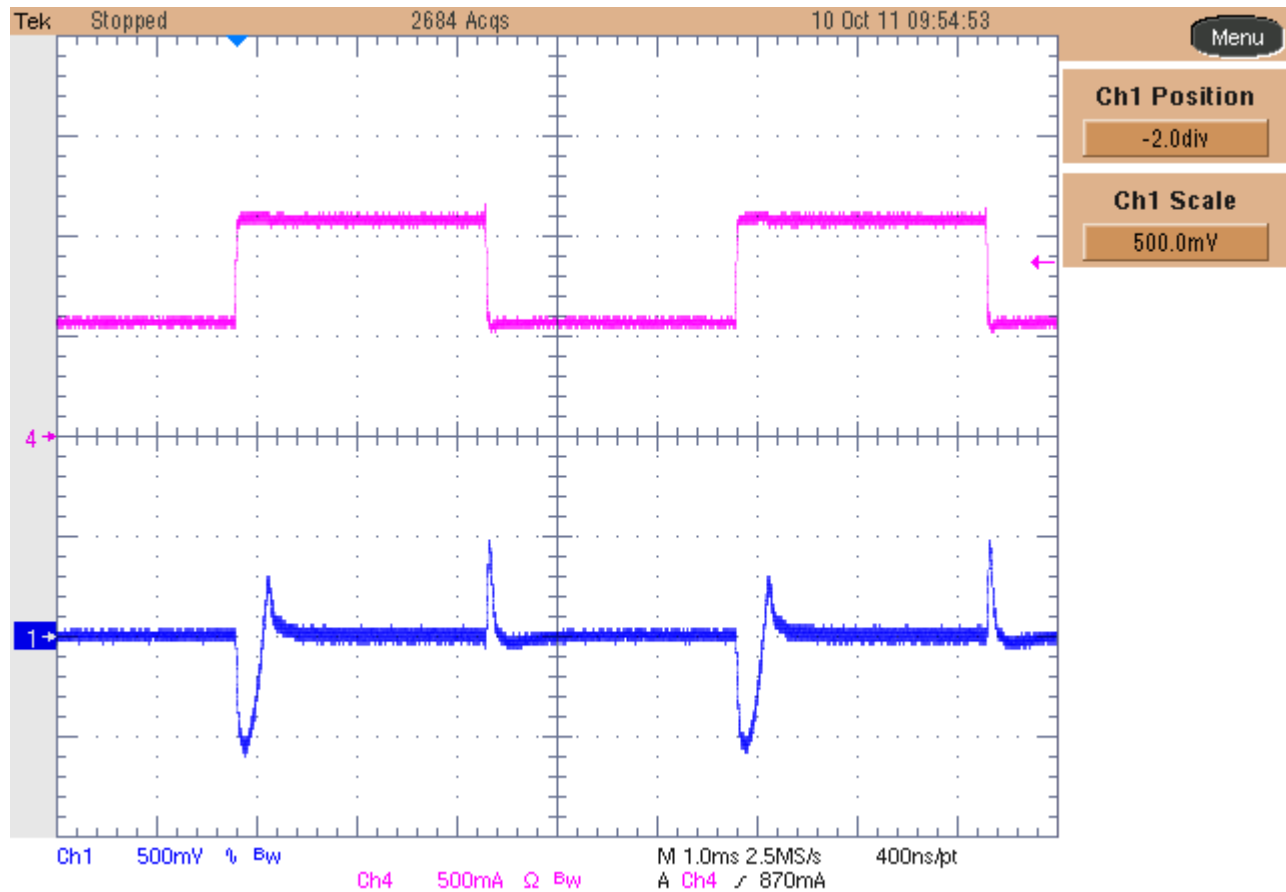


6. Transient Response

The image below shows the transient response of the output voltage while the load has been switched between 0.5A and 1A (50% to 100% of nominal load). The input voltage was 3.3V.

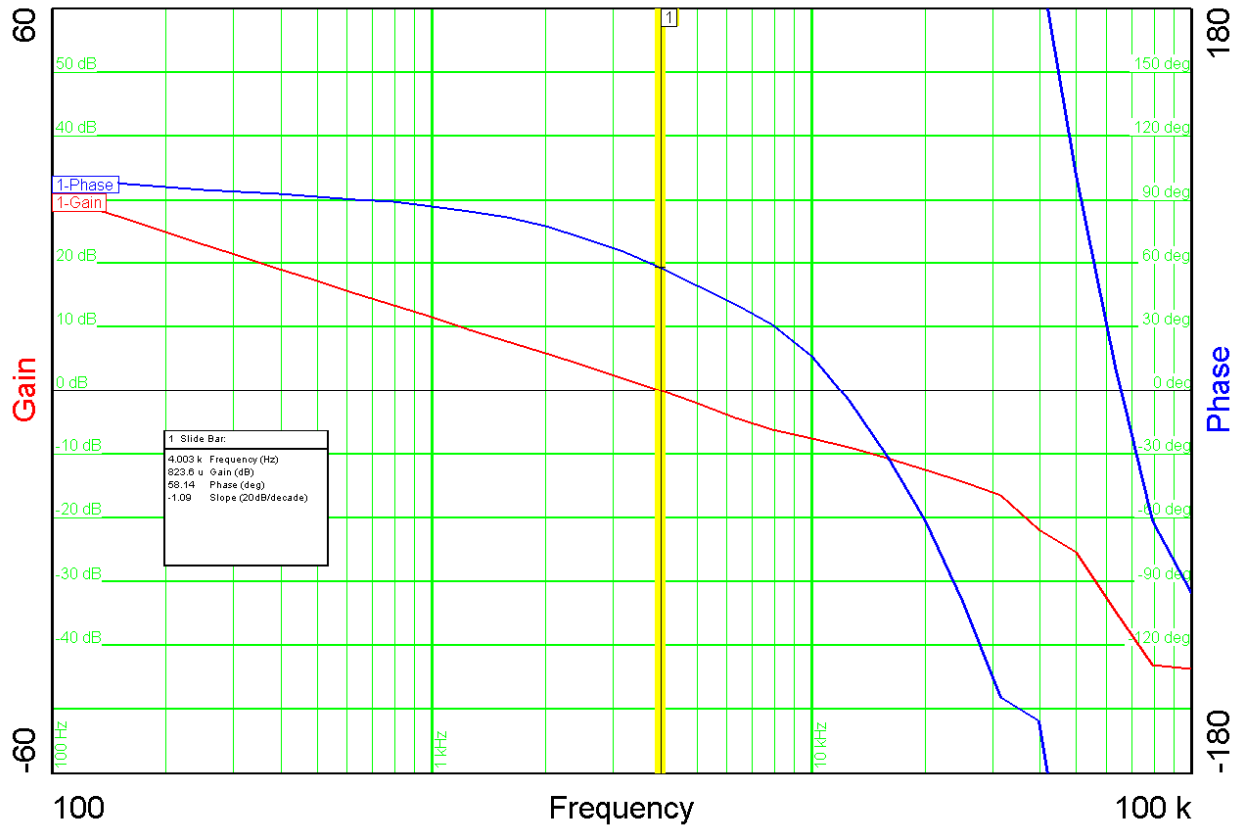
Channel 1: Output Voltage (500mV/div, 1ms/div, 20MHz BWL, AC coupling).

Channel 4: Output Current (500mA/div, 20MHz BWL, DC coupling).



7. Feedback loop

The graph below shows the bode-plot measurement taken on the prototype while the input voltage has been set at 3.3V and the output load at 1A. The crossover frequency was 4 KHz, the phase margin 58.14 deg. and the gain margin 8.7dB.



8. Thermal Image

The image below shows the thermal image of the prototype taken in still air condition. The input voltage was 3.3V and the output load 1A.

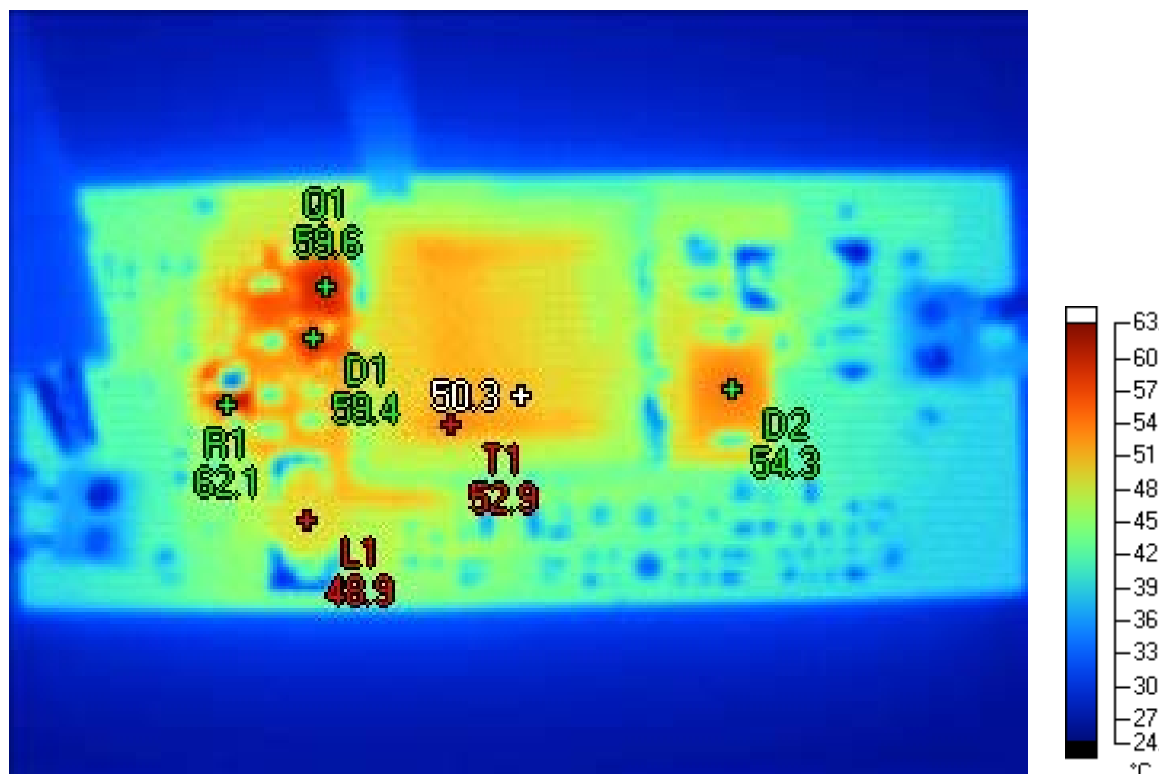


Image Info

Average Temperature	36.6 °C
Calibration Range	-20.0 °C to 350.0 °C
Camera Model	Ti40FT
Image Range	25.5 °C to 62.1 °C
Image Time	10/10/2011 10:17:14 AM
Manufacturer	Fluke

Markers

Label	Temperature	Emissivity	Background
Center Point	50.3 °C	0.95	23.0 °C
R1	62.1 °C	0.95	23.0 °C
Q1	59.6 °C	0.95	23.0 °C
D1	59.4 °C	0.95	23.0 °C
T1	52.9 °C	0.95	23.0 °C
L1	48.9 °C	0.95	23.0 °C
D2	54.3 °C	0.95	23.0 °C

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