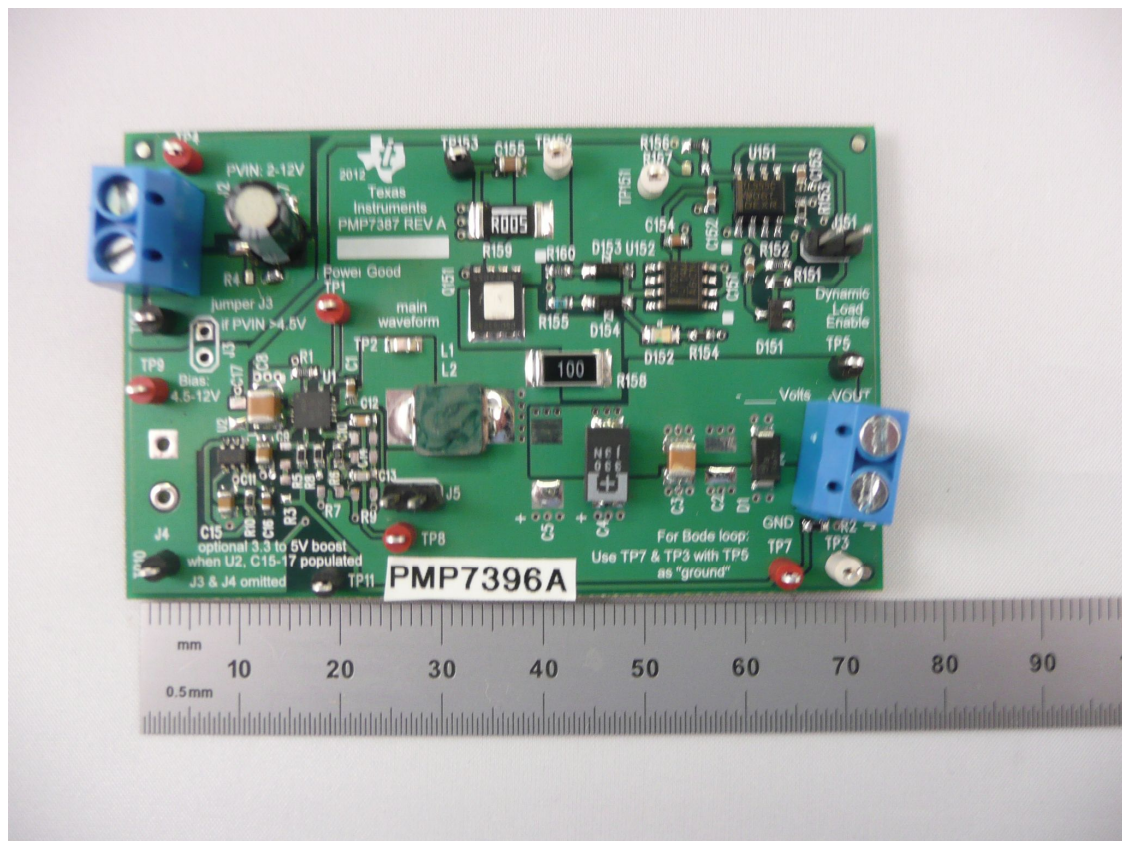


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General notes:

- For 5V bias needed by TPS54620, switched cap REG710NA-5 used.
- Max first application load was 1.1A. However, design has capability beyond that, and was tested up to 1.8A load off 3 to 3.6Vin.



Input, output data and efficiency: (room ambient temperature)**R13 = 49.9 ohms (for Bode testing)**

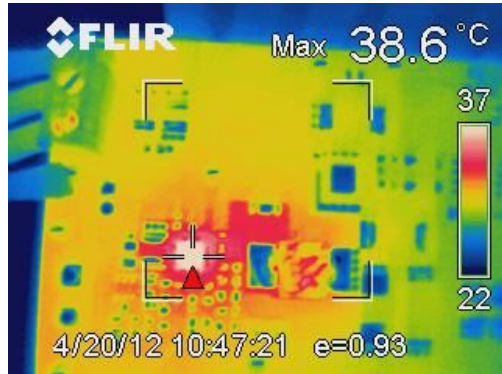
Vin Volts	Iin A	Vout Volts	Iout A	% Efficiency	Losses in W
3.024	3.912	-5.155	-1.797	78.3	2.566
2.976	3.183	-5.161	-1.502	81.8	1.721
2.973	2.690	-5.163	-1.301	84.0	1.280
2.985	2.2325	-5.165	-1.108	85.9	0.941
2.976	2.006	-5.165	-1.002	86.7	0.795
2.986	1.4625	-5.167	-0.747	88.4	0.507
2.957	0.9745	-5.168	-0.497	89.1	0.313
2.973	0.493	-5.169	-0.2465	86.9	0.192
2.976	0.0435	-5.170	0	0.0	0.129
3.337	3.412	-5.158	-1.792	81.2	2.143
3.300	2.798	-5.161	-1.5015	83.9	1.484
3.305	2.373	-5.1635	-1.301	85.7	1.125
3.329	1.974	-5.165	-1.109	87.2	0.843
3.304	1.783	-5.166	-1.001	87.8	0.720
3.304	1.313	-5.167	-0.7475	89.0	0.476
3.324	0.8635	-5.168	-0.4965	89.4	0.304
3.333	0.441	-5.169	-0.2465	86.7	0.196
3.324	0.0425	-5.170	0	0.0	0.141
3.638	3.060	-5.159	-1.793	83.1	1.882
3.633	2.499	-5.161	-1.5015	85.4	1.330
3.629	2.133	-5.164	-1.301	86.8	1.022
3.624	1.797	-5.1655	-1.108	87.9	0.789
3.623	1.613	-5.166	-1.001	88.5	0.673
3.619	1.193	-5.167	-0.7475	89.5	0.455
3.634	0.7895	-5.169	-0.497	89.5	0.300
3.624	0.407	-5.169	-0.2465	86.4	0.201
3.613	0.042	-5.170	0	0.0	0.152

Qq

Thermal images:

Full application load off ~3Vin where currents and losses are highest:

3.005Vin 2.207Ain -5.166Vout 1.104A

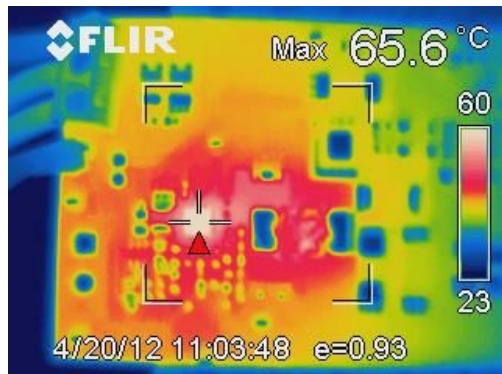


Qq

The TPS54620 is hottest reaching 39 degrees Celsius. Surrounding PCB and choke in the low 30's and ambient 21-23 degrees Celsius.

Load was then increased to almost 1.8A with similar Vin:

3.024Vin 3.912Ain -5.155Vout at 1.797A run for ~15minutes



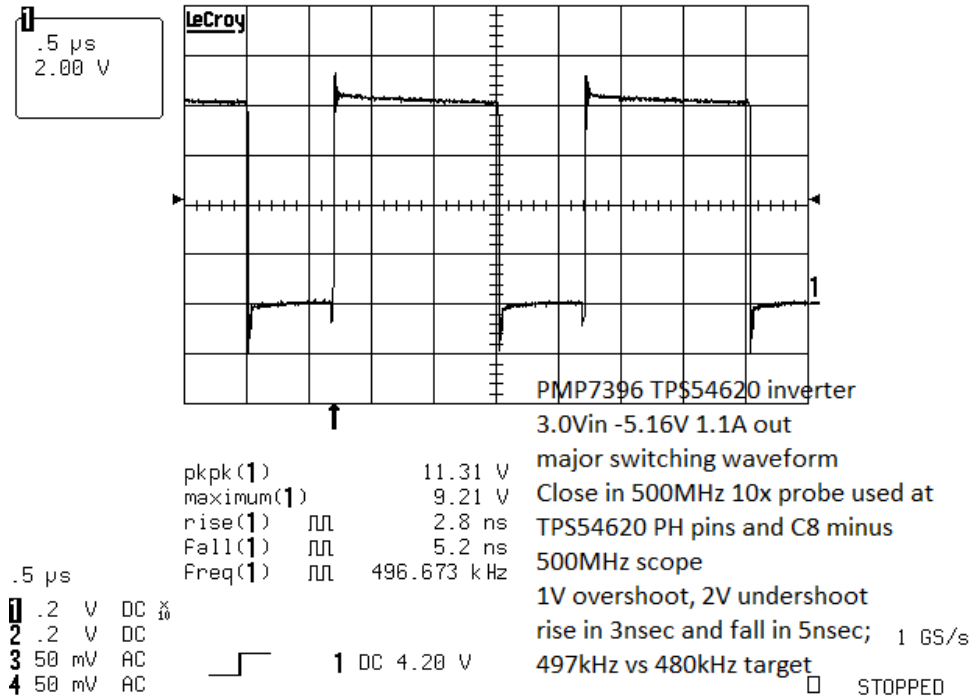
The TPS54620 is hottest reaching 66 degrees Celsius. Surrounding PCB and choke in the mid 50's and ambient 21-23 degrees Celsius.

Qq

Main waveform: Maximum application load shown:

20-Apr-12

11:18:49

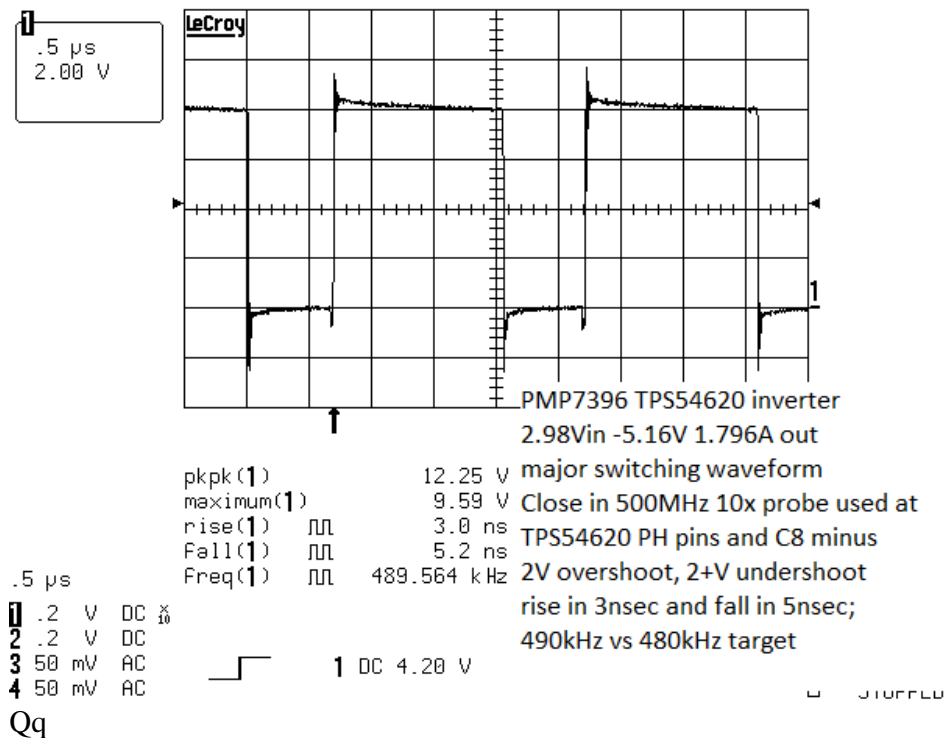


And now: max load of near 1.8V with switch current close to 6A max

23-Apr-12

Reading Floppy Disk Drive

12:29:59

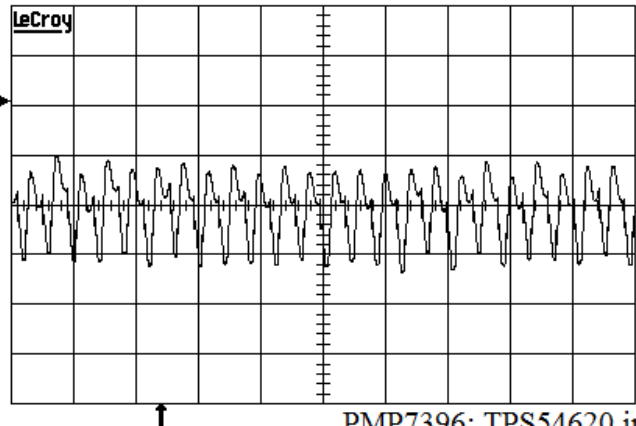
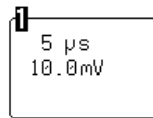


Qq

Output Ripple at 1.8A load off -5.16V output with 2.98Vin:

23-Apr-12

12:34:17



pkpk(1) 23.7mV
 maximum(1) 11.0mV
 rise(1) μ s 302.0 ns
 fall(1) μ s 979.9 ns
 Freq(1) μ s 493.341 kHz

5 μ s BWL
 1 10 mV AC
 2 .2 V DC
 3 50 mV AC
 4 50 mV AC



1 DC 22.0mV

PMP7396: TPS54620 inverter off 3-
 3.6Vin with REG710NA-5 for 5V bias
 Ripple at 1.8A load off -5.16V output
 with 2.98Vin

Measured off output cap C3 with
 20MHz Bandwidth and 1x close in
 probe: 24mV p-p or <1/2% of Vout

B STOPPED

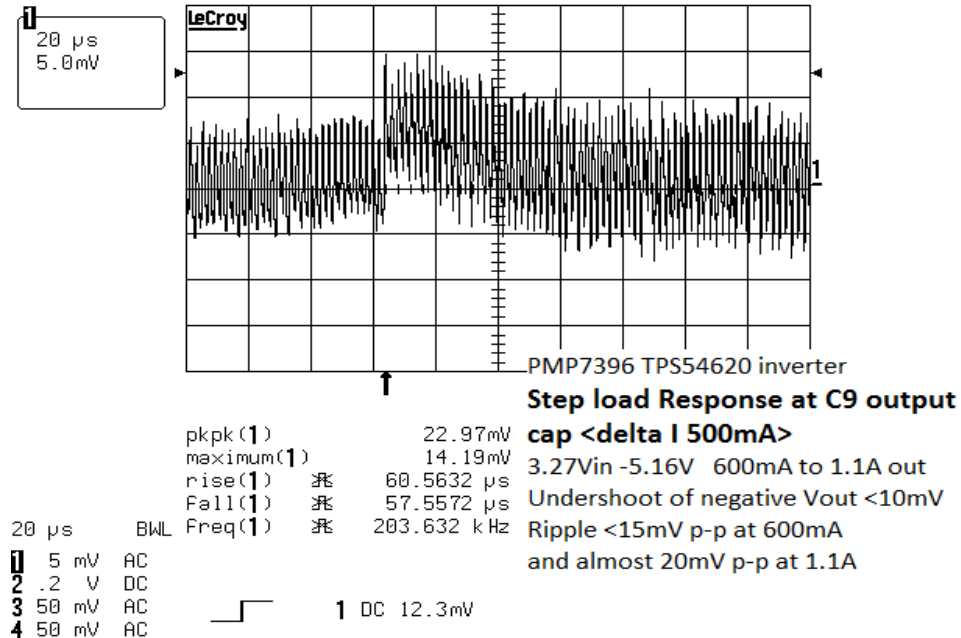
Qq

Output dynamics / ripple: 3.27V_{in} from 600mA to 1.1A and back to 600mA

Load step:

23-Apr-12

12:39:00

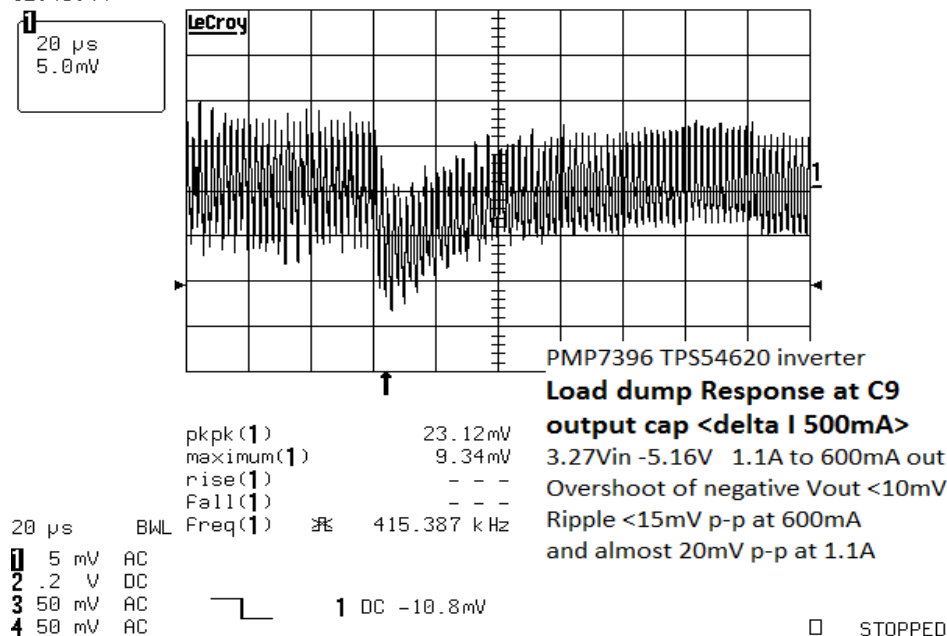


Qq

And Load dump:

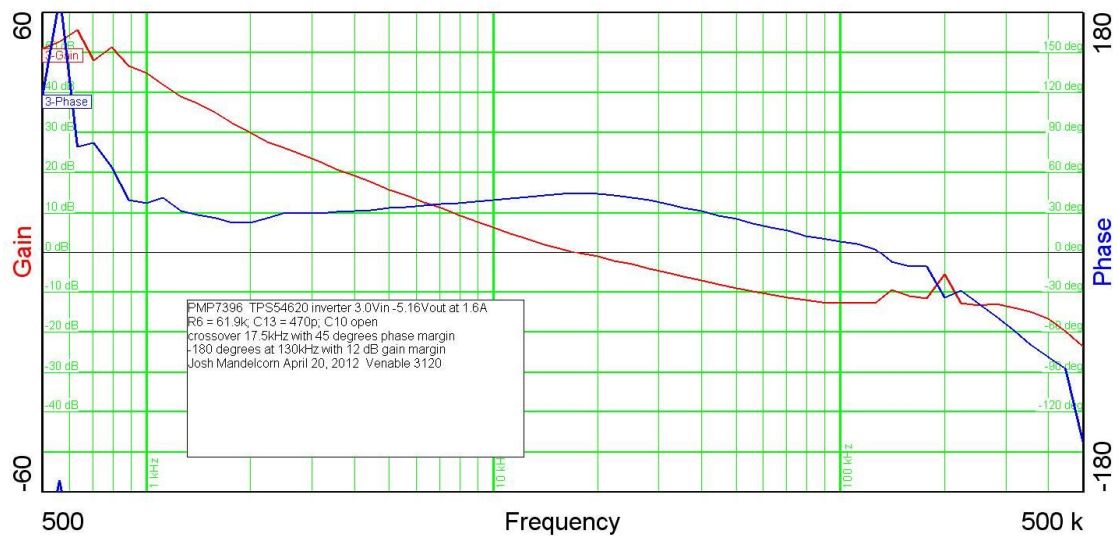
23-Apr-12

12:40:44



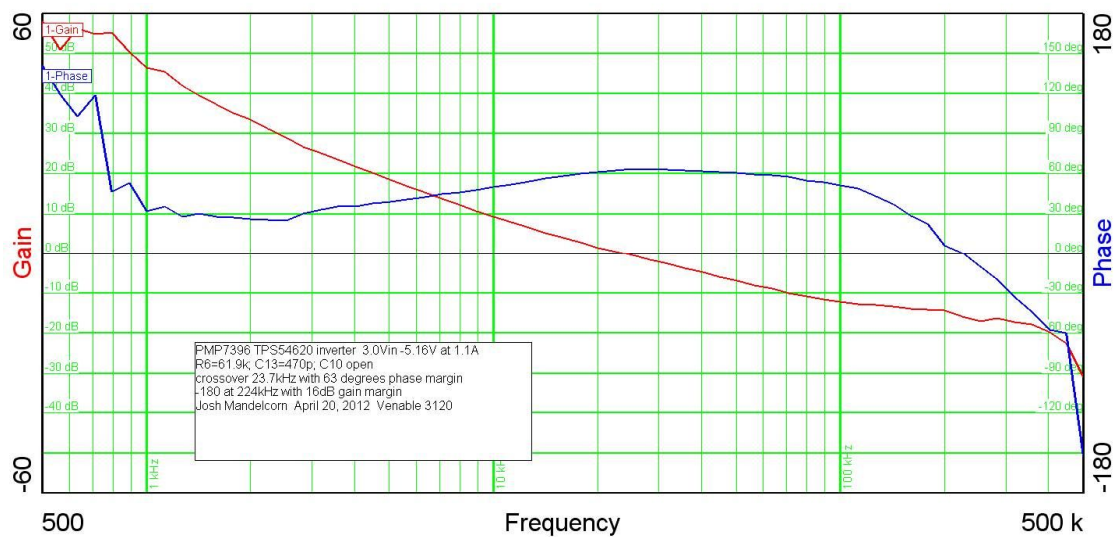
Qq

Bode plots of main voltage control loop: 3.0Vin and 1.6A load off -5.16V



Qq

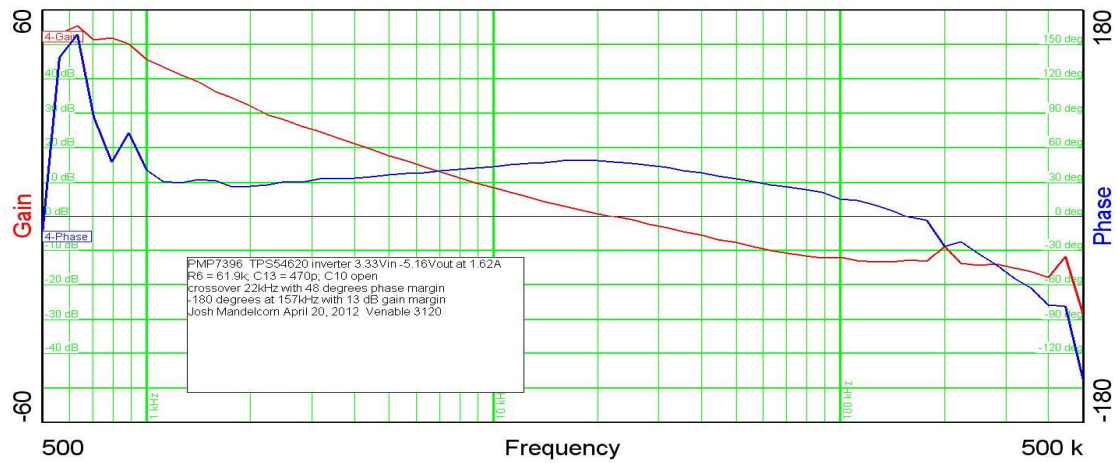
Same 3Vin, but 1.1A load (full application load) off -5.16V



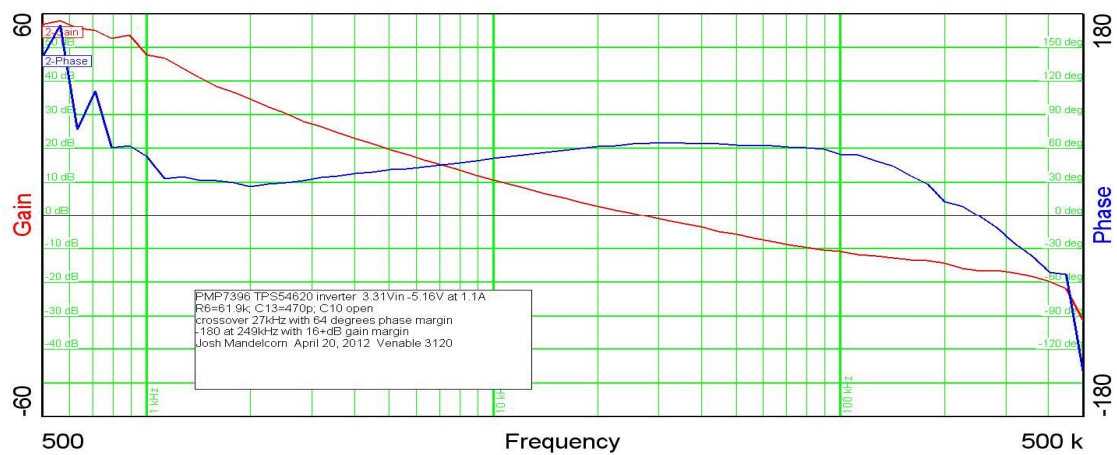
Qq

Bode plots continued:

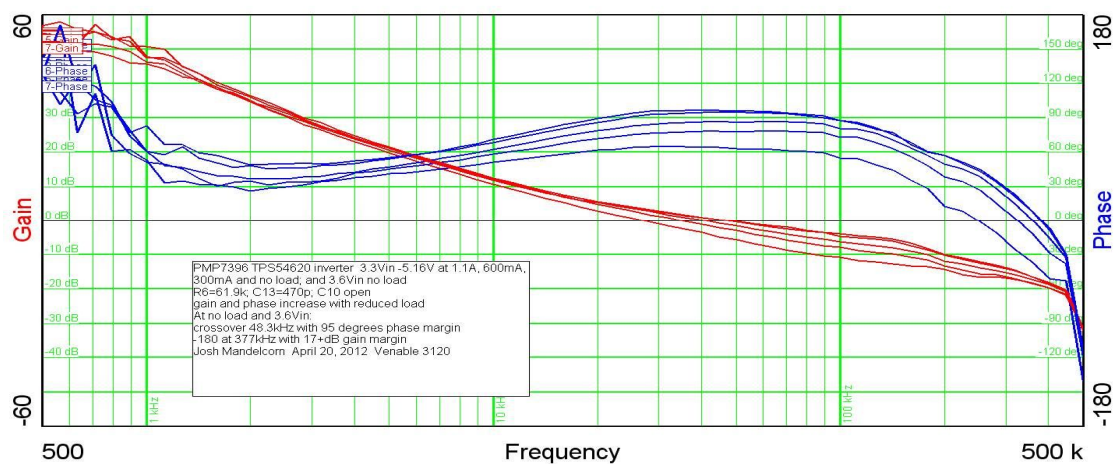
3.3Vin and 1.6A off -5.16V



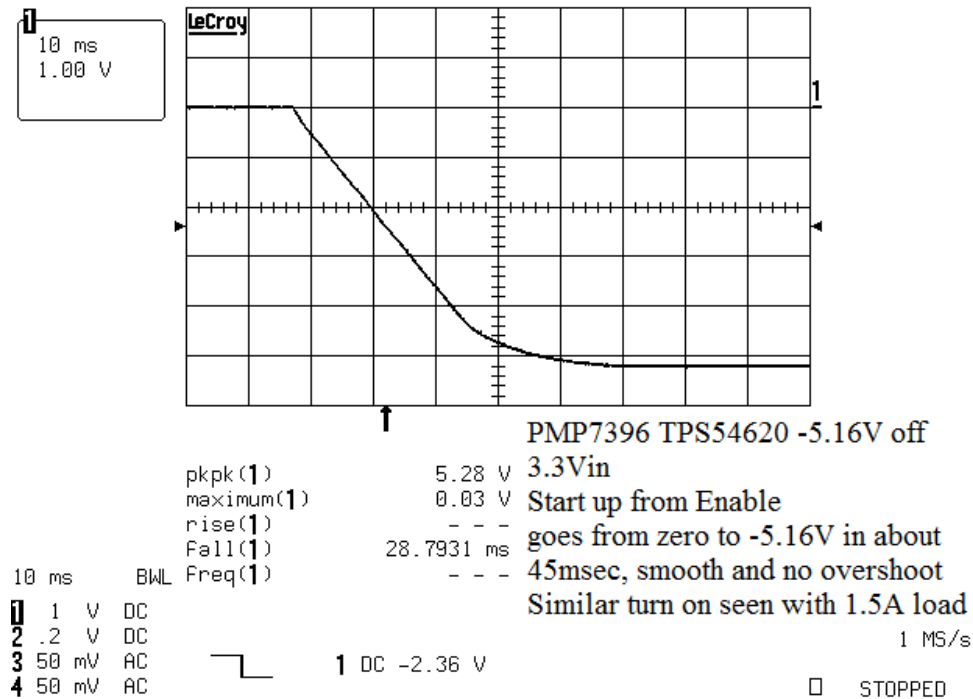
3.3Vin and 1.1A off -5.16A



3.3Vin and various loads off -5.16V from 1.1A down to zero A and 3.6V no load:

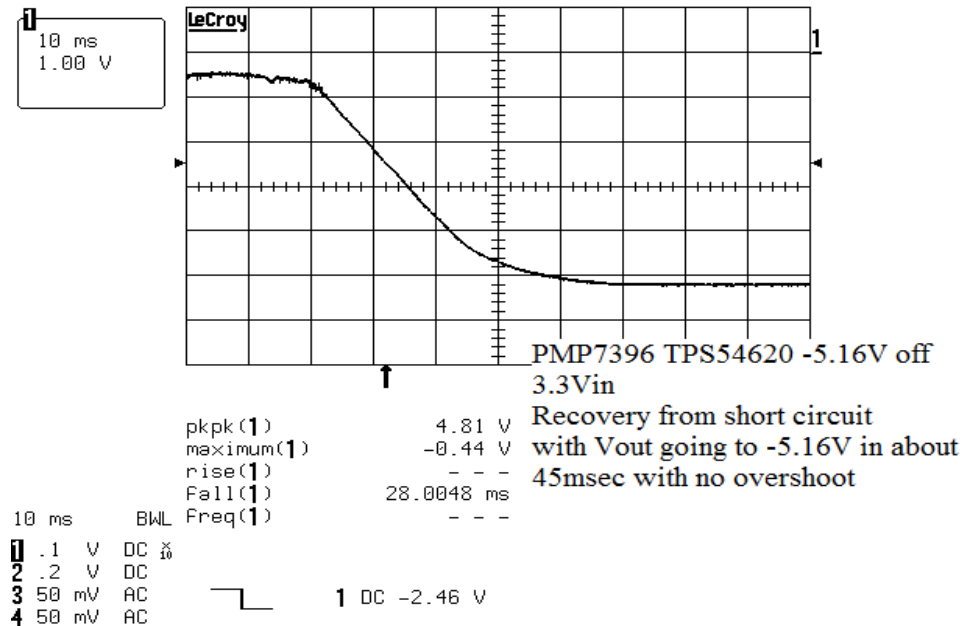


Start up:

23-Apr-12
12:47:47

Qq

Short circuit recovery:

23-Apr-12
12:58:12

Qq

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