Test Data
For PMP7992
8/12/2013

Circuit Description

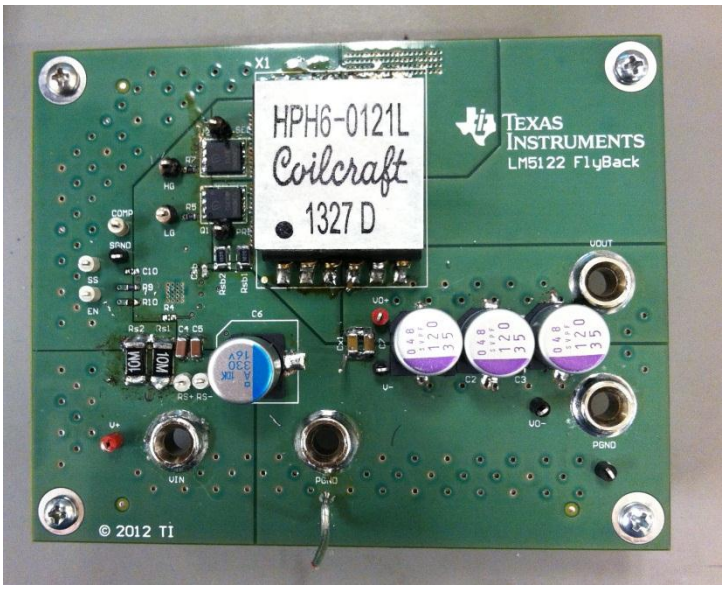
PMP7992 is a non-isolated synchronous flyback converter using the LM5122 for industrial applications. It uses an off the shelf transformer. The benefit of using a synchronous flyback over a SEPIC converter is size. The test report here is for a 12V in 12V out @ 5A of load current. Switching frequency is set to 230 kHz. The efficiency of this design can be significantly improved if a custom flyback transformer is used.

Vin	12V +/-10%
Vout	12V
Iout Max	5A
Fsw	230 kHz

Fabrication

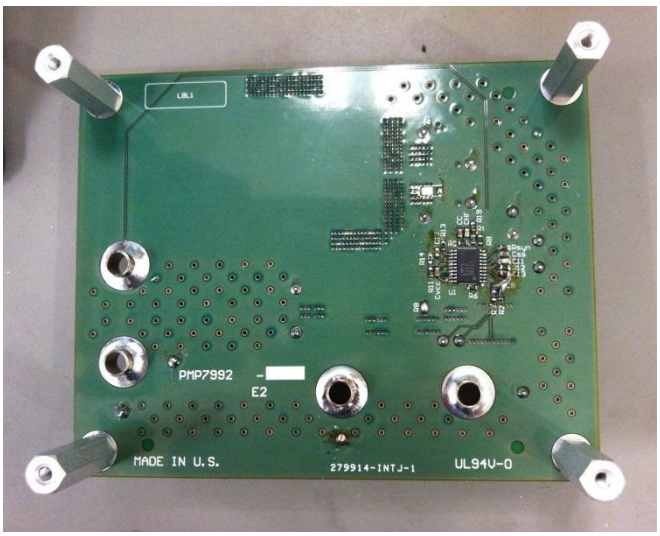
Top Side

Board Dimension 4” x 3.17”



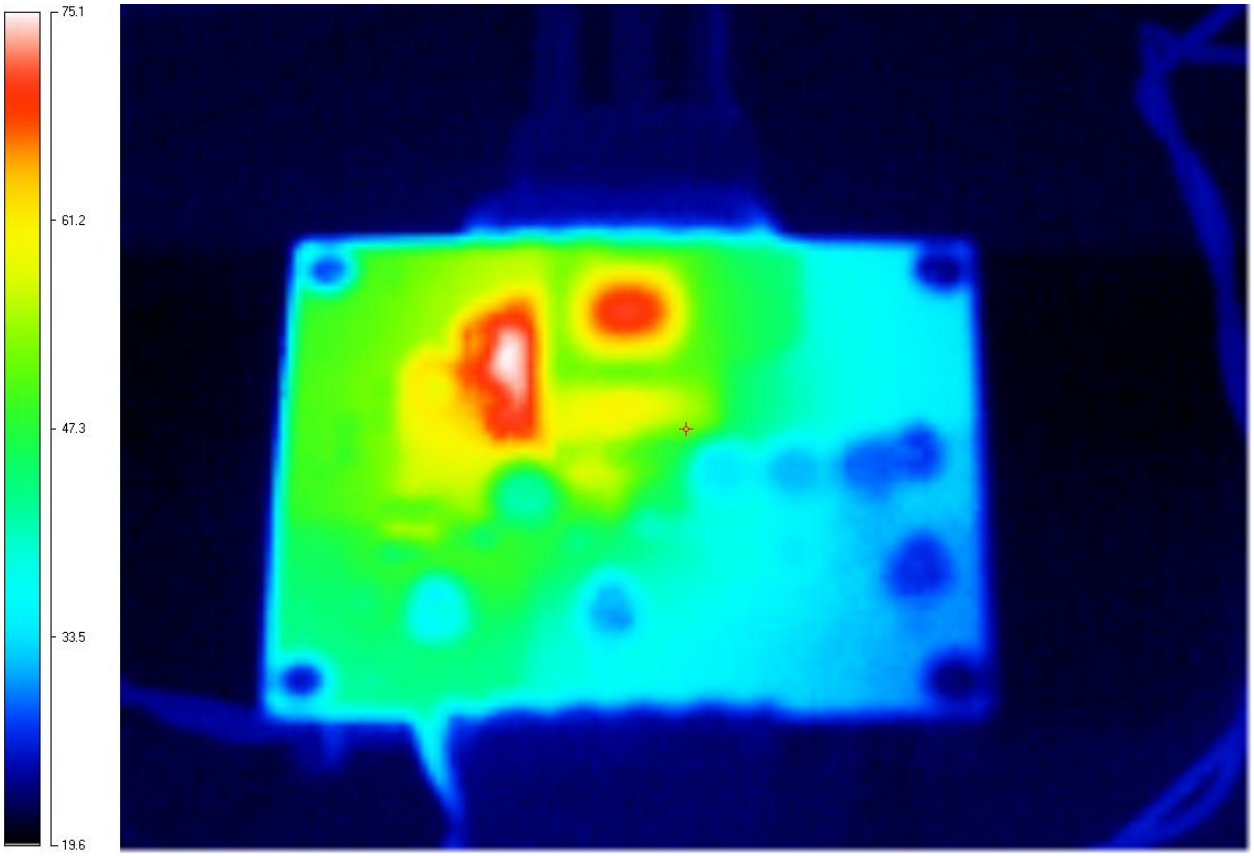
The approximate component area is 2.0” x 2.0”

Bottom Side



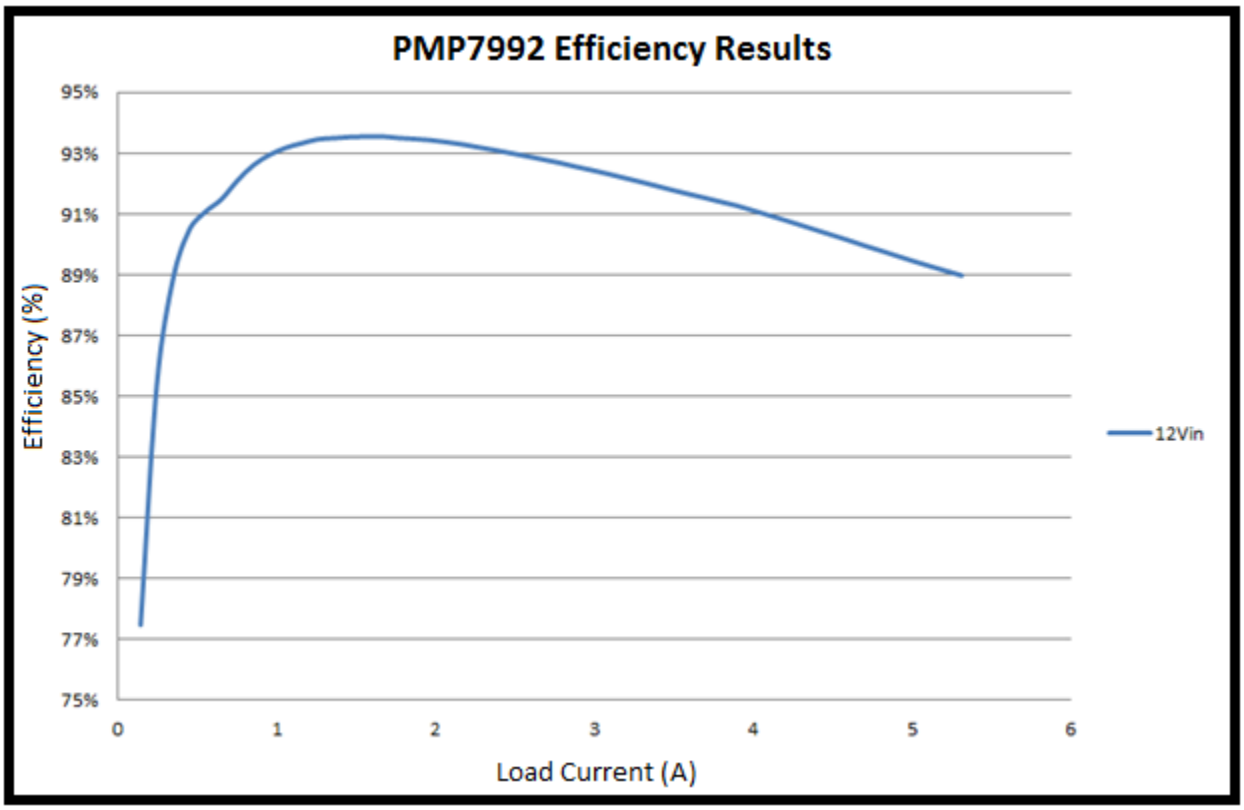
Steady state temperature

This image was taken at steady state, 12V in, 12V out at a load of 5A.



Transformer, MOSFETs and snubber resistors are the hottest items.

Efficiency Curve



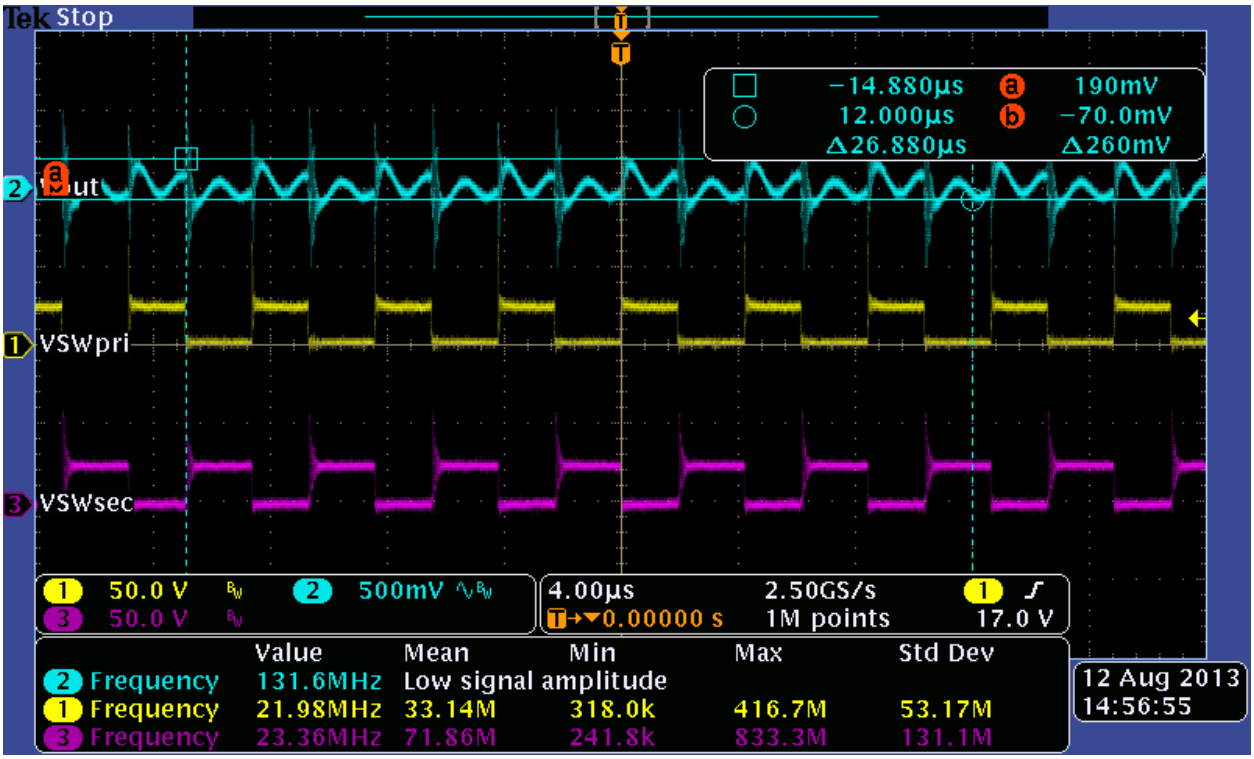
Efficiency Curve Data

V_{IN}	I_{IN}	V_{OUT}	I_{OUT}	P_{IN}	P_{OUT}	Ploss	Eff
12.0455567	5.8124	11.97238	5.212079	70.0131	62.401	7.6121	0.89128
12.0461037	5.5673	11.9739	5.009631	67.0642	59.985	7.0793	0.89444
12.0466897	5.3224	11.97541	4.807115	64.1173	57.567	6.5502	0.89784
12.0473467	5.0791	11.97713	4.604443	61.1902	55.148	6.0422	0.90126
12.0484042	4.8377	11.97836	4.401852	58.2864	52.727	5.5595	0.90462
12.049655	4.598	11.98009	4.19908	55.4048	50.305	5.0995	0.90796
12.0511192	4.3607	11.98146	3.996323	52.5509	47.882	4.6691	0.91115
12.0526276	4.1269	11.98307	3.793892	49.7399	45.462	4.2775	0.914
12.0536947	3.8955	11.98439	3.591136	46.955	43.038	3.9174	0.91657
12.05437	3.6646	11.9857	3.387937	44.1747	40.607	3.5679	0.91923
12.0553471	3.436	11.98687	3.185668	41.4218	38.186	3.2356	0.92189
12.0565459	3.2085	11.988	2.982877	38.6835	35.759	2.9248	0.92439
12.0576638	2.9831	11.98912	2.780493	35.9691	33.336	2.6334	0.92679
12.0583225	2.7588	11.99006	2.577321	33.2667	30.902	2.3645	0.92892
12.0581264	2.5368	11.99127	2.374851	30.5891	28.477	2.1116	0.93097
12.0578856	2.3158	11.99208	2.172101	27.9231	26.048	1.8751	0.93285
12.057618	2.0969	11.99292	1.969617	25.2836	23.621	1.6621	0.93426
12.057642	1.8796	11.99381	1.766669	22.663	21.189	1.4739	0.93497
12.0579398	1.6632	11.99433	1.564089	20.0552	18.76	1.295	0.93543
12.05677	1.4483	11.99481	1.361076	17.4623	16.326	1.1364	0.93492
12.0558063	1.2351	11.99538	1.158373	14.8898	13.895	0.9947	0.9332
12.0556991	1.0234	11.99582	0.955881	12.3377	11.467	0.8711	0.92939
12.0561616	0.8139	11.99635	0.753309	9.81293	9.037	0.776	0.92092
12.0567633	0.6012	11.99652	0.550206	7.24862	6.6006	0.6481	0.9106
12.0567678	0.3891	11.99682	0.347332	4.69144	4.1669	0.5246	0.88819
12.056332	0.1856	11.99685	0.144515	2.23762	1.7337	0.5039	0.77481

Waveforms

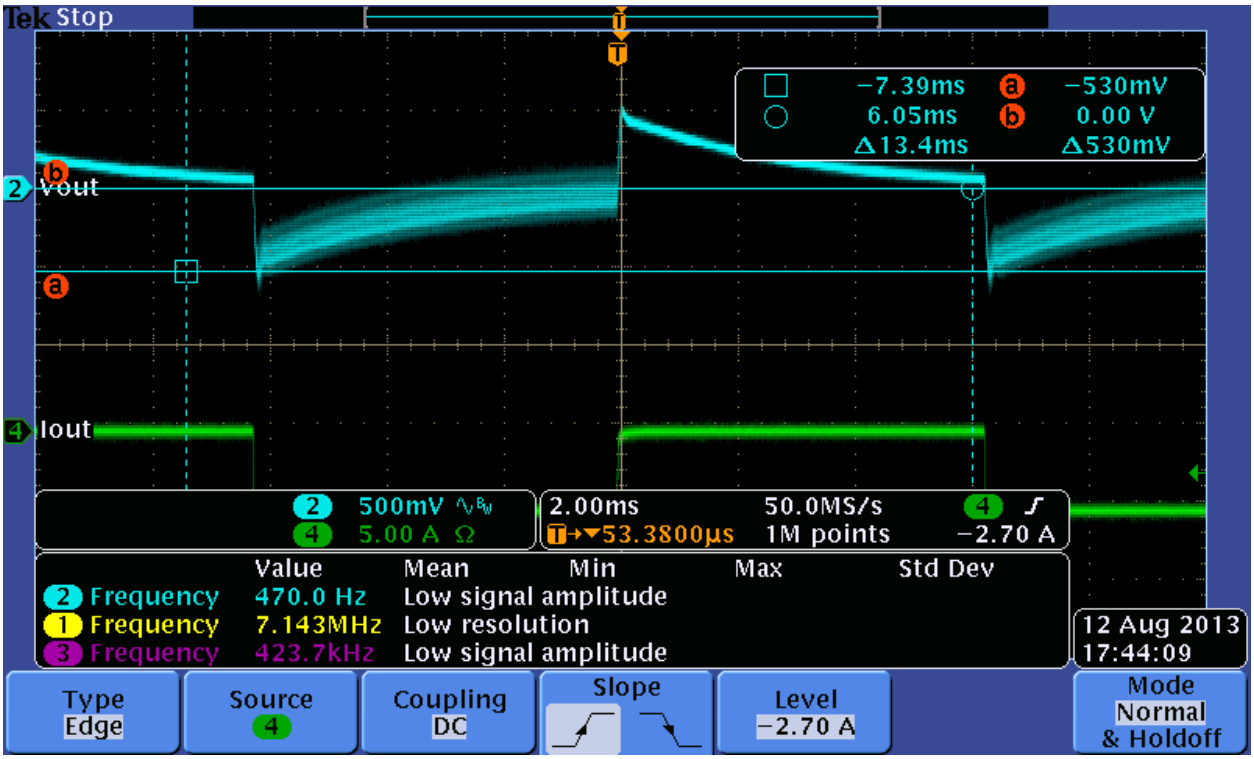
CH2 Vout

12Vin, 12V out @ 5A load current. (260mV p-p Ripple)



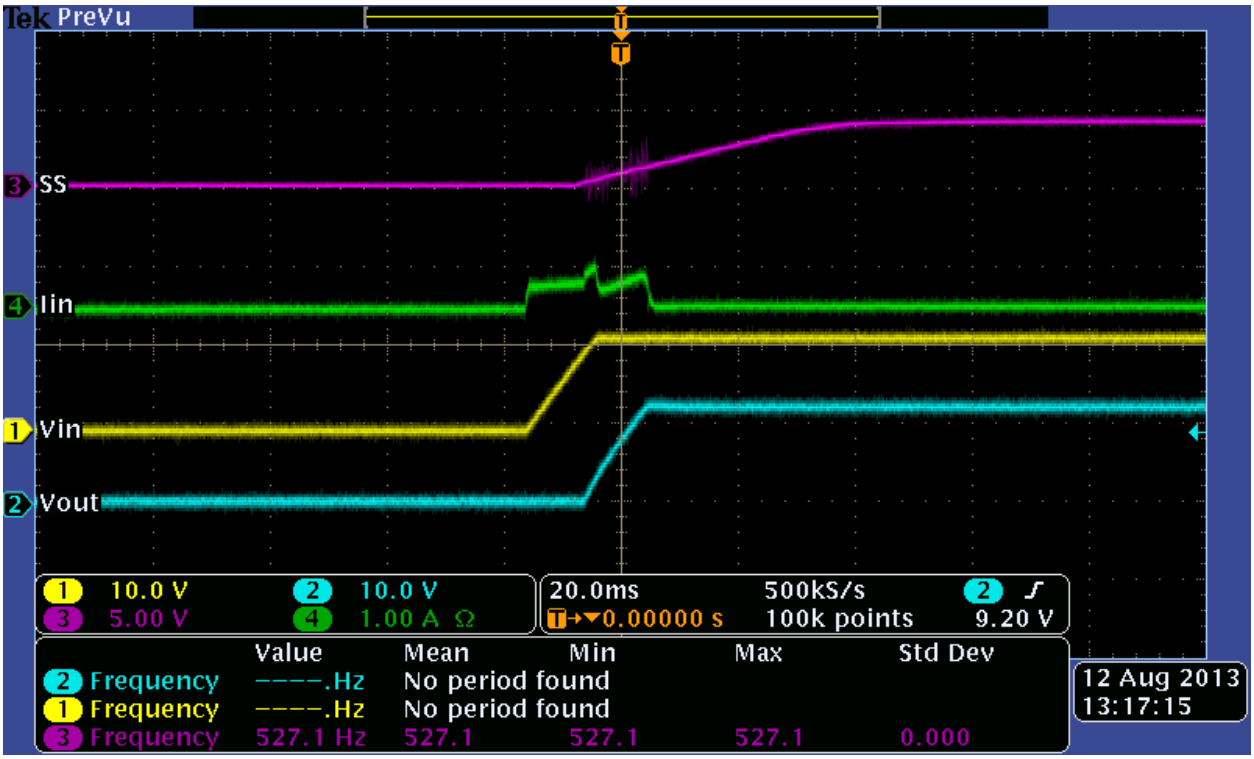
Transient Response Test

12V in @ 2.5A to 5A, 100mA/us Pulse frequency 200 Hz, 50% duty cycle, 12V out.

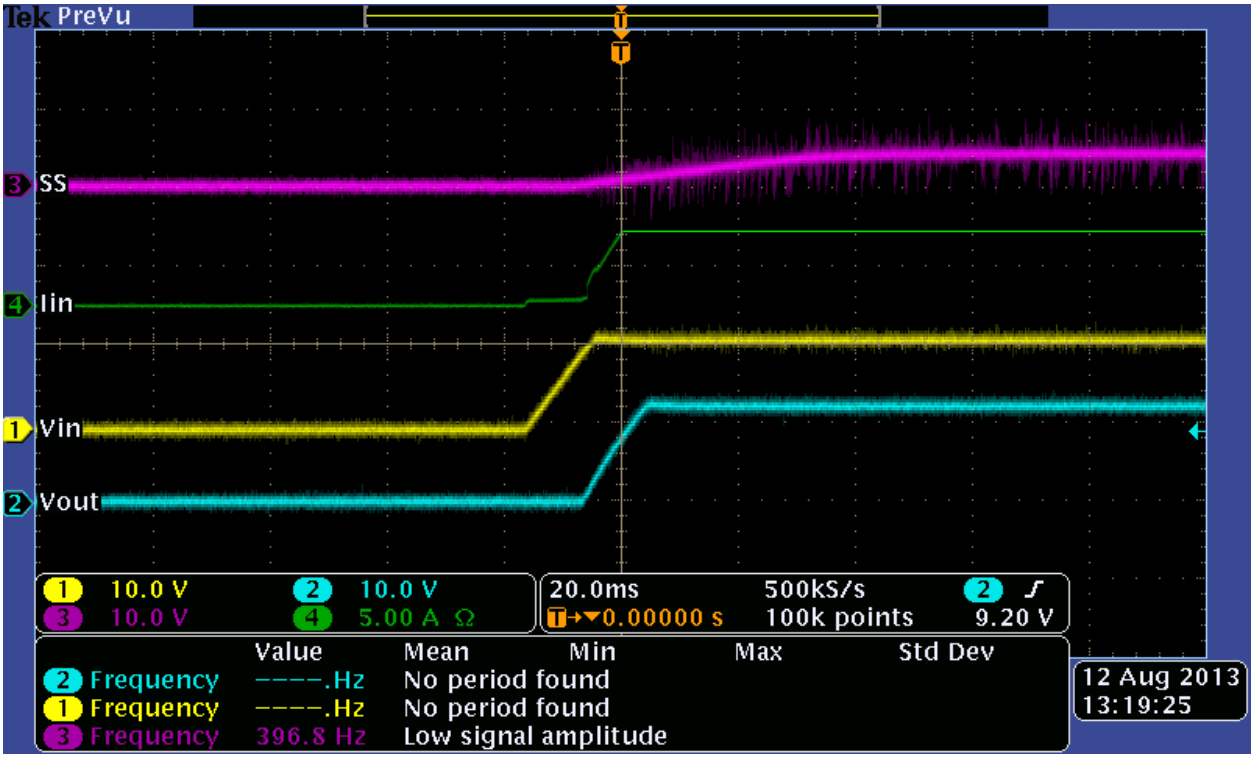


Startup Test

12Vin, 12V out @ no load current.



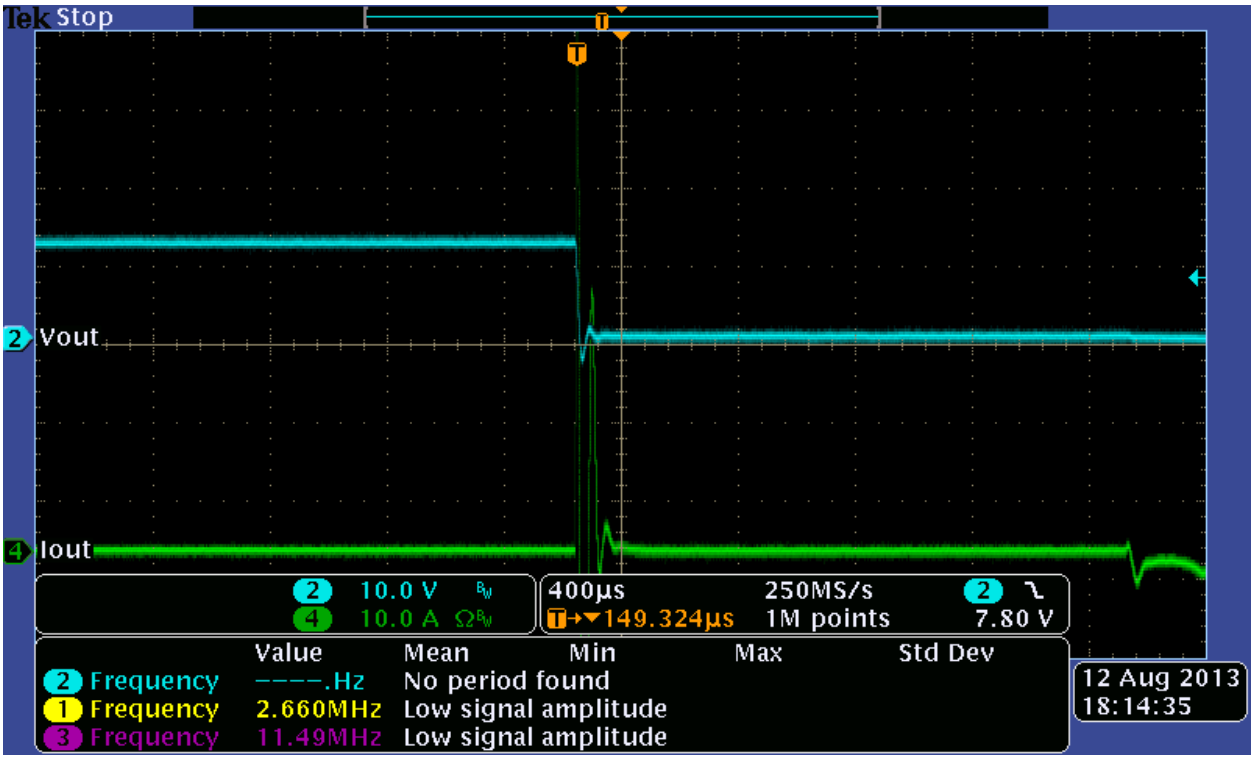
12Vin, 12V out @ 2.4 ohm Load.



Short Circuit Test

Applied to board under the following conditions

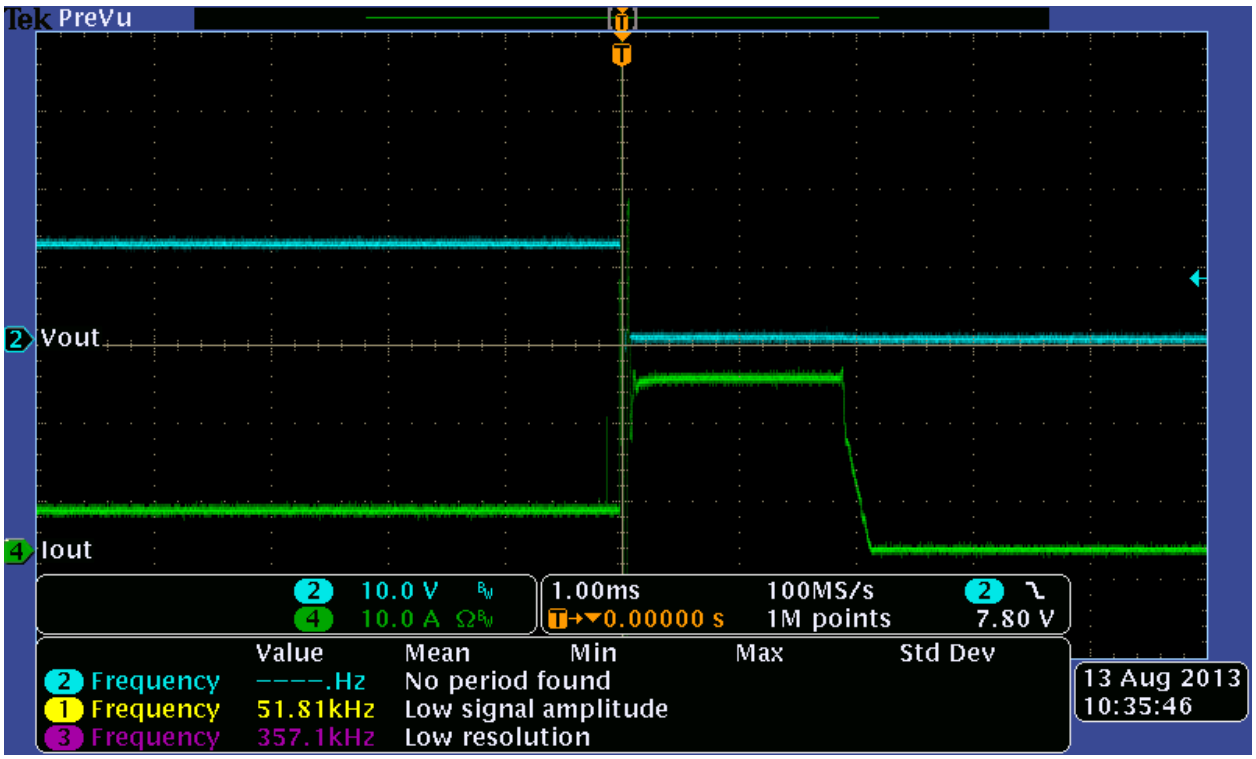
12Vin, 12V out @ 0A load current.



Short Circuit Test

Applied to board under the following conditions

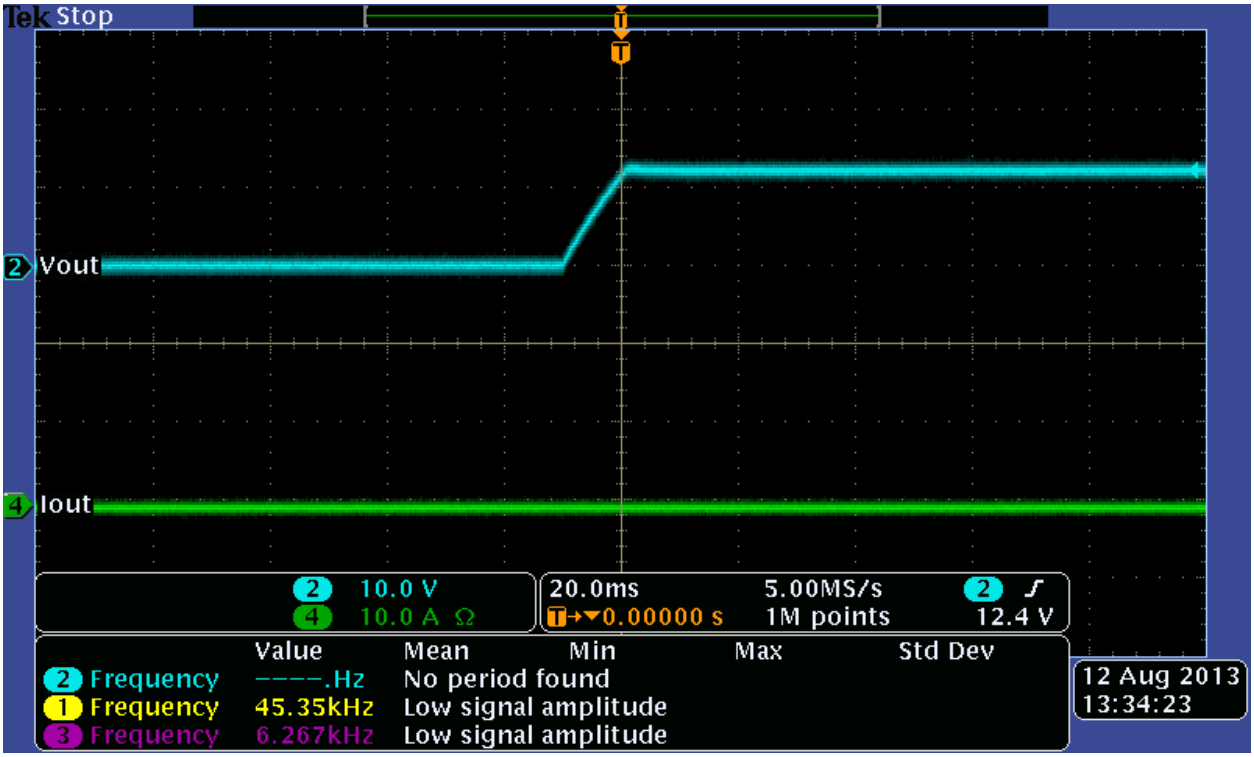
12Vin, 12V out @ 5A load current.



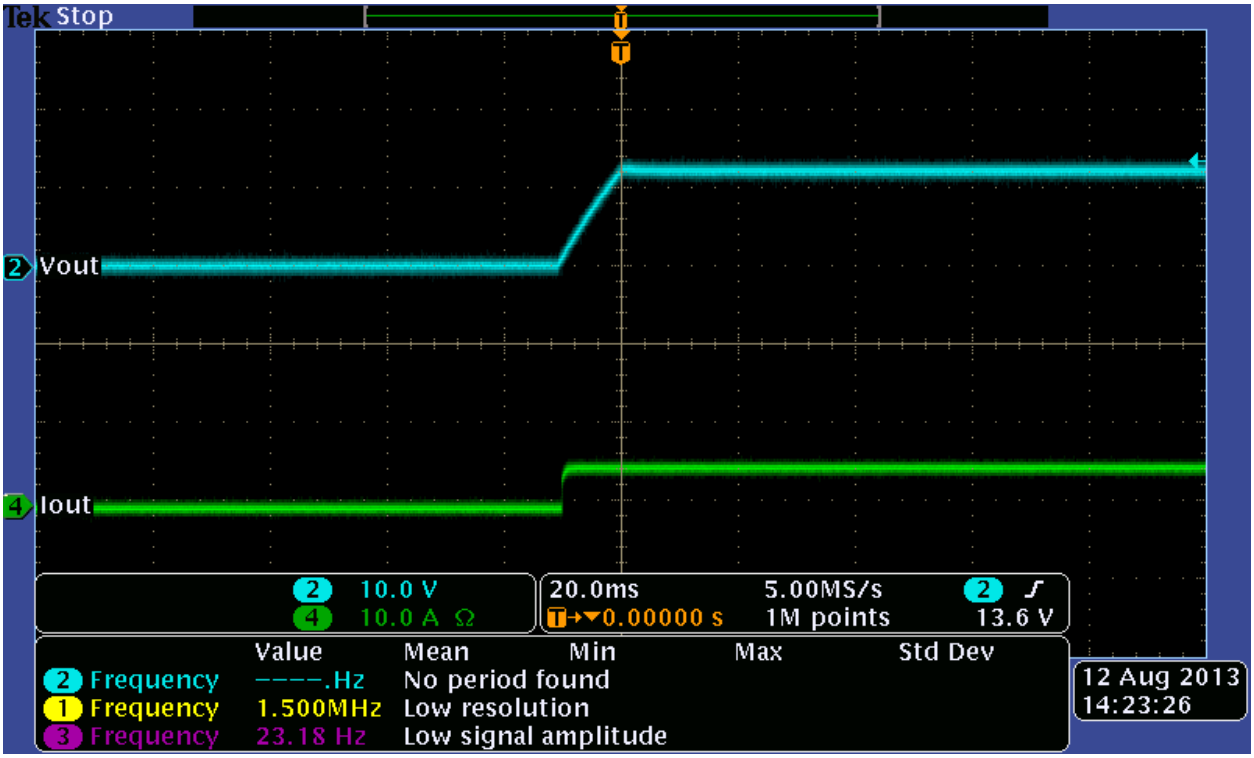
Short Circuit Recovery Test

Applied to board under the following conditions

12Vin, 12V out @ 0A load current.



12Vin, 12V out @ 5A load current.



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