



PMP10770 TPS53219 Test Report

11/4/2014

The following test report is for the PMP10770 TPS53219:

VIN = 12V (10-14V)

VOUT = 1V @ 34A

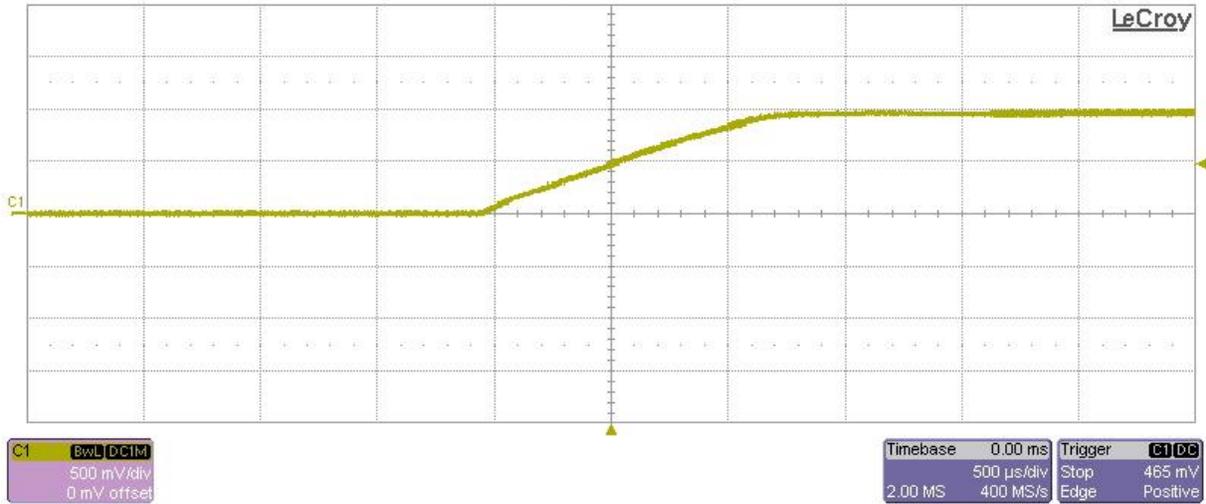
The tests performed were as follows:

1. Startup (No load)
2. Shutdown (100mΩ load)
3. Output Voltage Ripple
 - i. No load at VOUT
 - ii. Full (34A) load at VOUT
4. Load Transient
5. Switching Waveforms
6. Efficiency
7. Load Regulation
8. Thermal Profile
9. EVM Photo

1 Startup

The picture below shows the startup waveform. The input voltage is 12V, the output is not loaded.

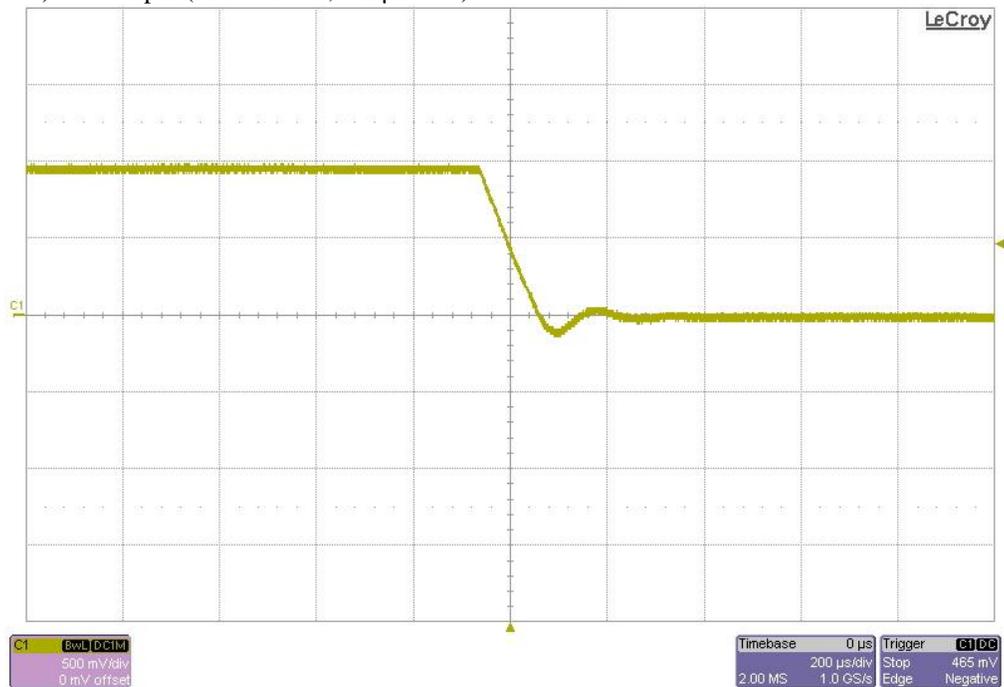
Channel 1 (yellow): 1V Output (500mV/DIV, 500µs/DIV)



2 Shutdown

The picture below shows the shutdown waveform. The input voltage is 12V, 100mΩ load.

Channel 1 (yellow): 1V Output (500mV/DIV, 200µs/DIV)



3 Output Voltage Ripple

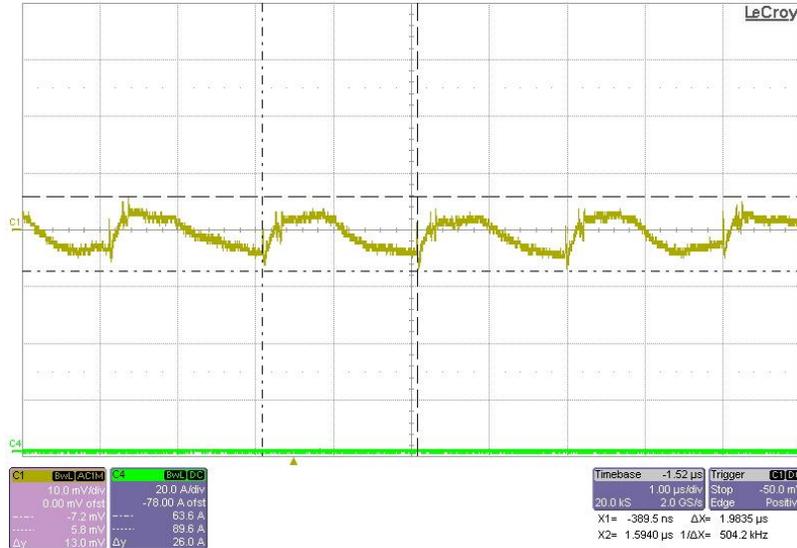
No Load:

The output voltage ripple is shown in the figure below. The input is 12V. The output voltage is AC coupled.

Channel 1 (yellow): VOUT (10mV/div)

Channel 2 (pink): IOUT (20A/div)

Output voltage ripple = 13.0mV



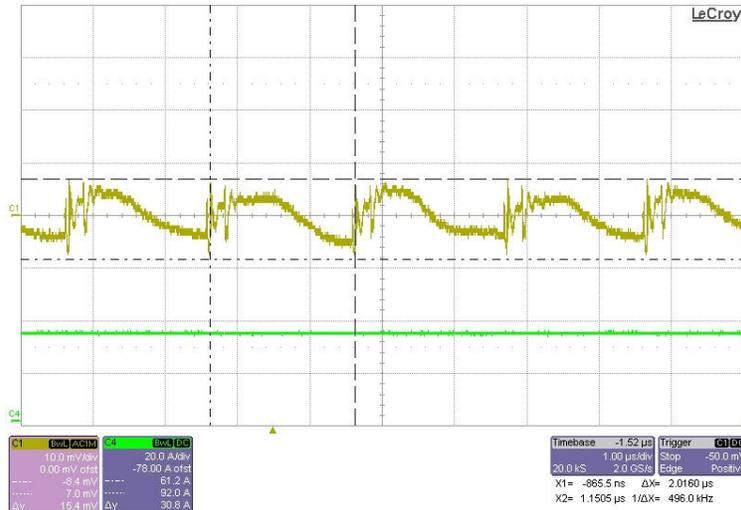
Full Load:

The output voltage ripple is shown in the figure below. The input is 12V. The output voltage is AC coupled.

Channel 1 (yellow): VOUT (10mV/div)

Channel 2 (pink): IOUT (20A/div)

Output voltage ripple = 15.4mV

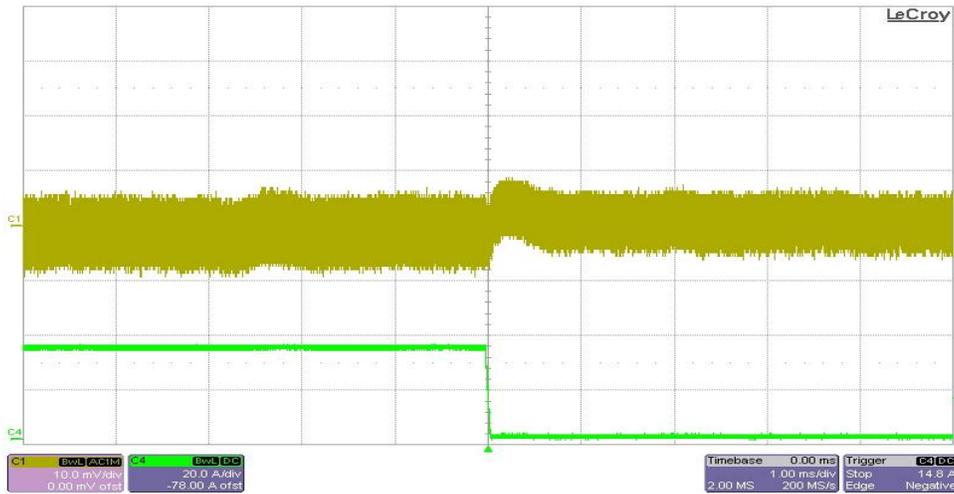
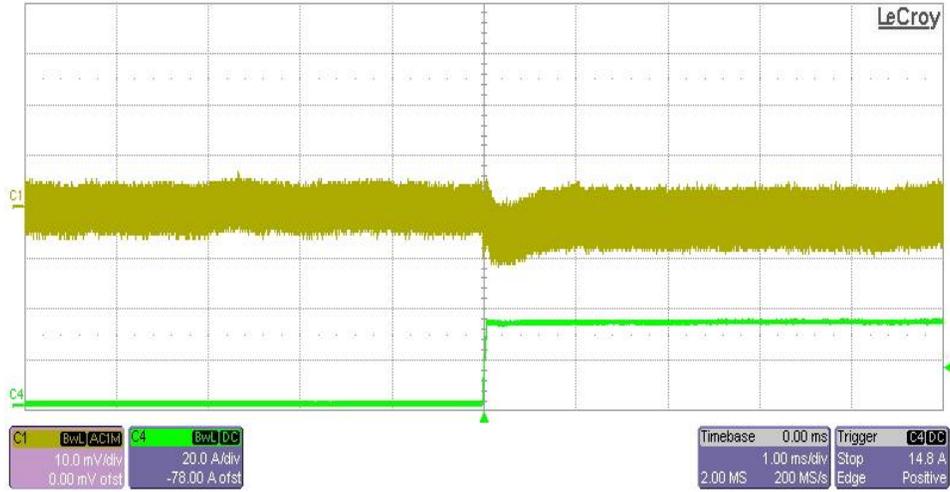


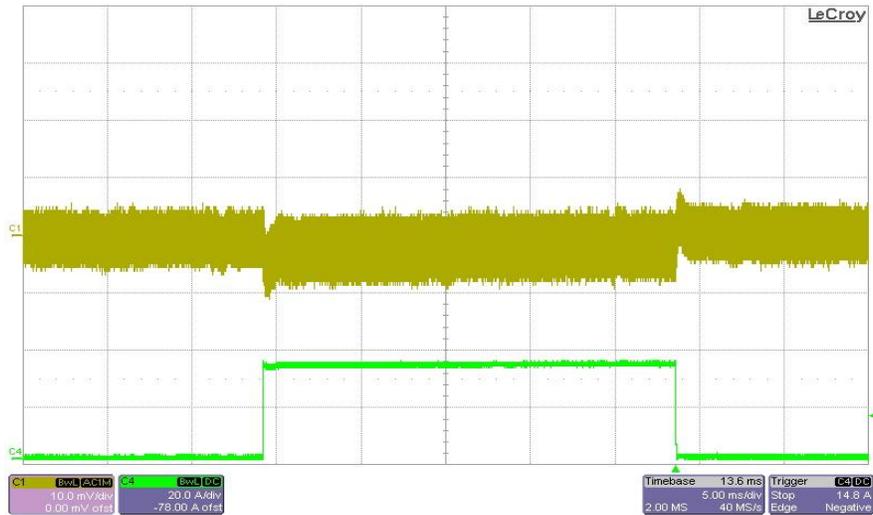
4 Load Transient – VOUT

The transient response is shown in the figure below. The input voltage is 12V. The current is pulsed from 17A to 34A.

Channel 1 (yellow): VOUT (10mV/div)

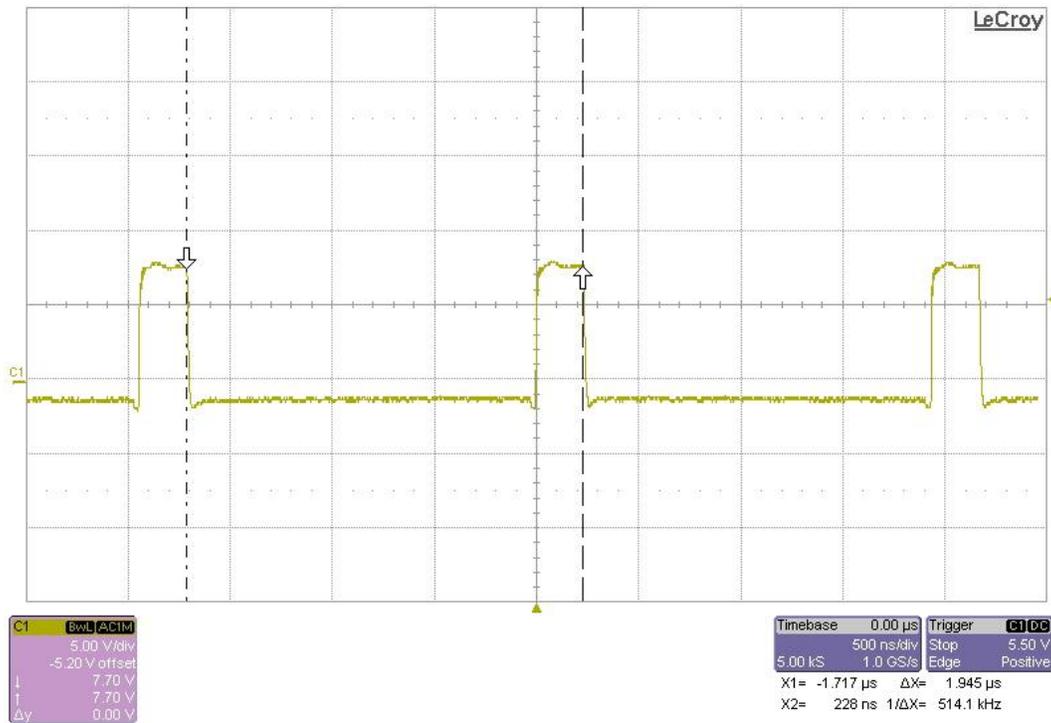
Channel 2 (pink): IOUT (20A/div)



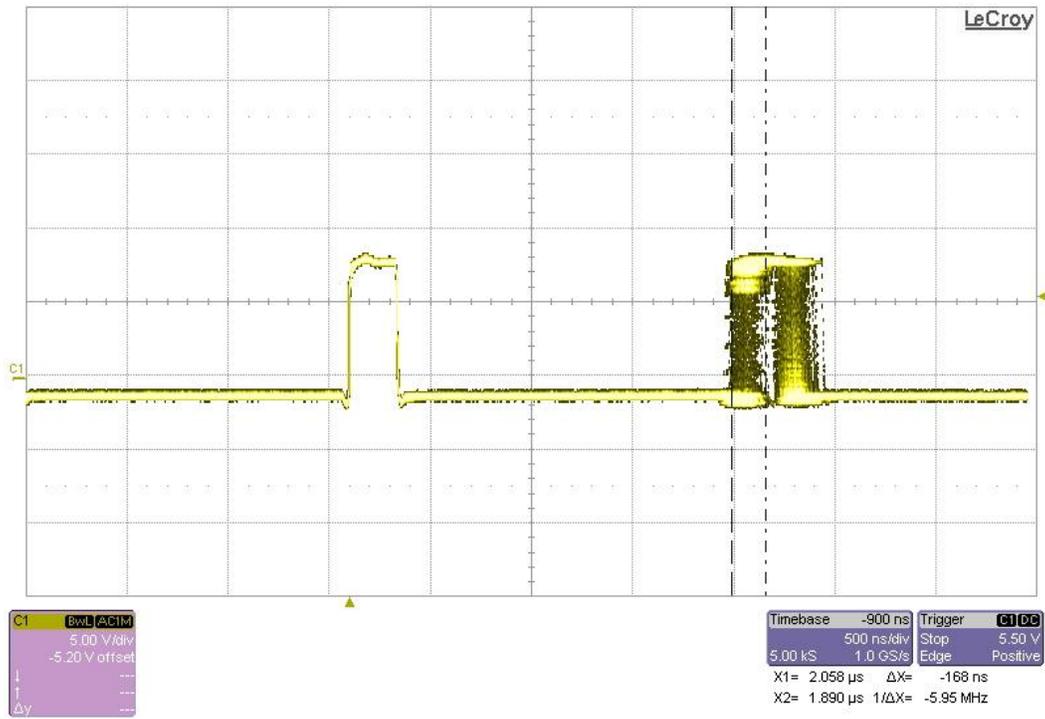


5 Switching Waveforms

The waveforms below show the switch node, and the switch node jitter measured with analog persistence on the oscilloscope. The input is 10V. The output is fully loaded to 34A.



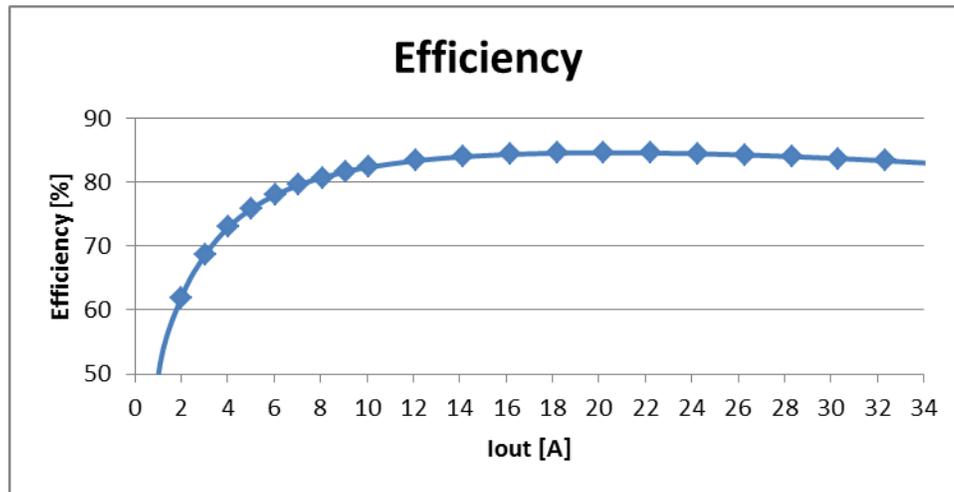
Fsw = ~514kHz



t_jitter = ~170ns

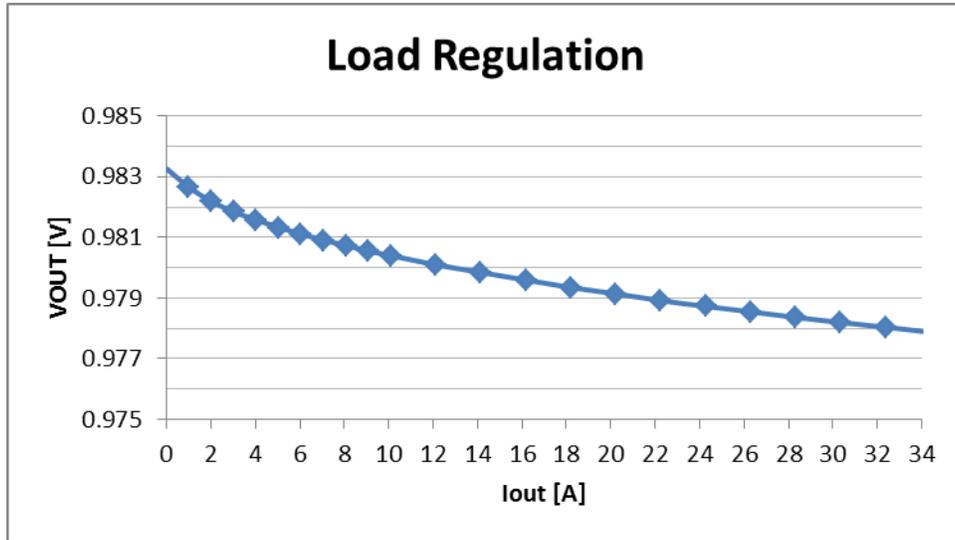
6 Efficiency – VOUT

VIN	IVIN	ILOAD	VOUT	EFFI%
11.99936	0.07113	-0.00034	0.983267	0.039054
11.99936	0.164729	0.993558	0.98266	49.39319
11.99936	0.26538	2.009	0.982188	61.9653
11.99936	0.360297	3.020193	0.981843	68.58957
11.99935	0.452064	4.032751	0.981573	72.97366
11.99934	0.543347	5.04432	0.981327	75.92447
11.99933	0.634652	6.055287	0.981116	78.0122
11.99931	0.725842	7.066141	0.980903	79.58107
11.99929	0.817548	8.076868	0.980736	80.74698
11.99928	0.909691	9.091385	0.98055	81.66783
11.99924	1.001928	10.10141	0.980399	82.3748
11.9992	1.187833	12.12598	0.980096	83.38304
11.99918	1.375323	14.1491	0.979844	84.00977
11.99912	1.564794	16.17411	0.979592	84.3838
11.99905	1.756037	18.19786	0.979347	84.58171
11.999	1.949445	20.22179	0.97914	84.64638
11.99897	2.145246	22.24577	0.978916	84.60029
11.99889	2.343457	24.2704	0.978727	84.47739
11.99883	2.544085	26.29232	0.978548	84.2831
11.99876	2.74792	28.31807	0.978363	84.0278
11.9987	2.954574	30.34138	0.978194	83.72036
11.99863	3.164311	32.36531	0.978043	83.37325
11.99856	3.378316	34.39263	0.977873	82.9695



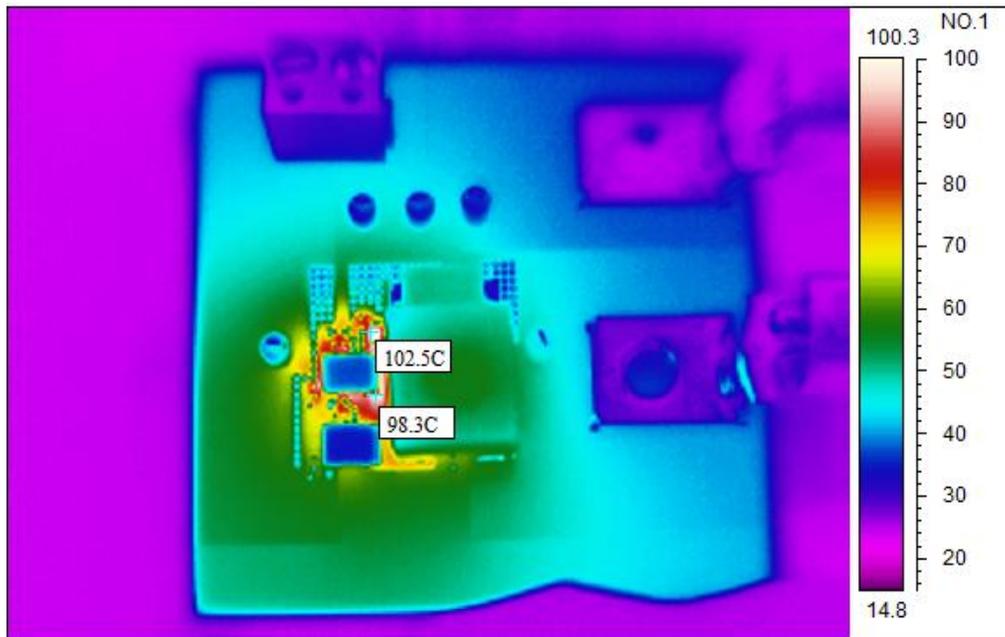
7 Load Regulation

A plot of the load regulation at VOUT is shown in the figure below. The load regulation is plotted vs load current for VIN = 12V.

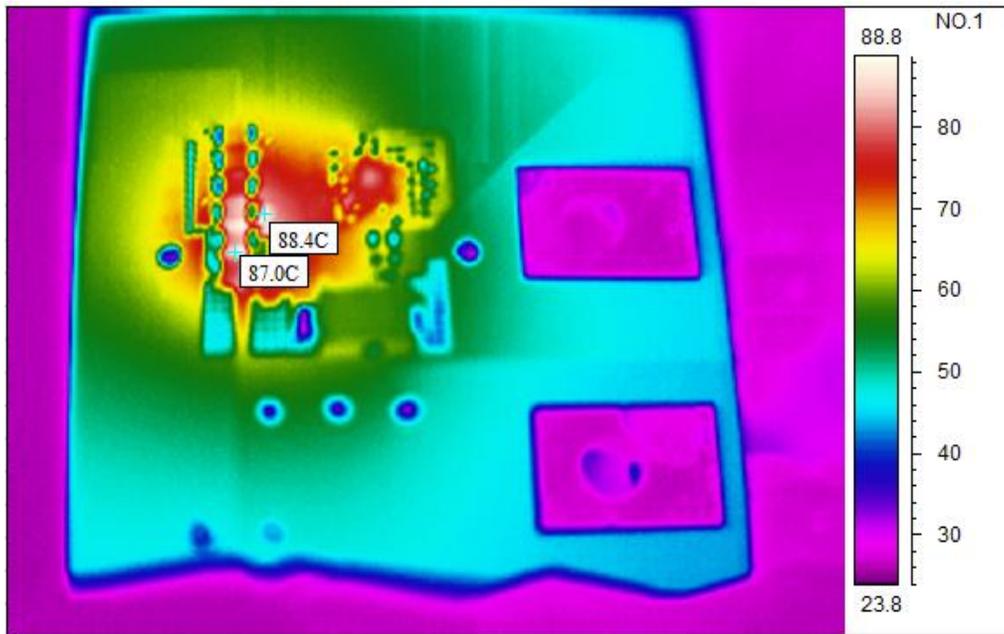


8 Thermal Profile

The figures below show the thermal profile of the board at max VOUT load (34A) with 400LFM of airflow.

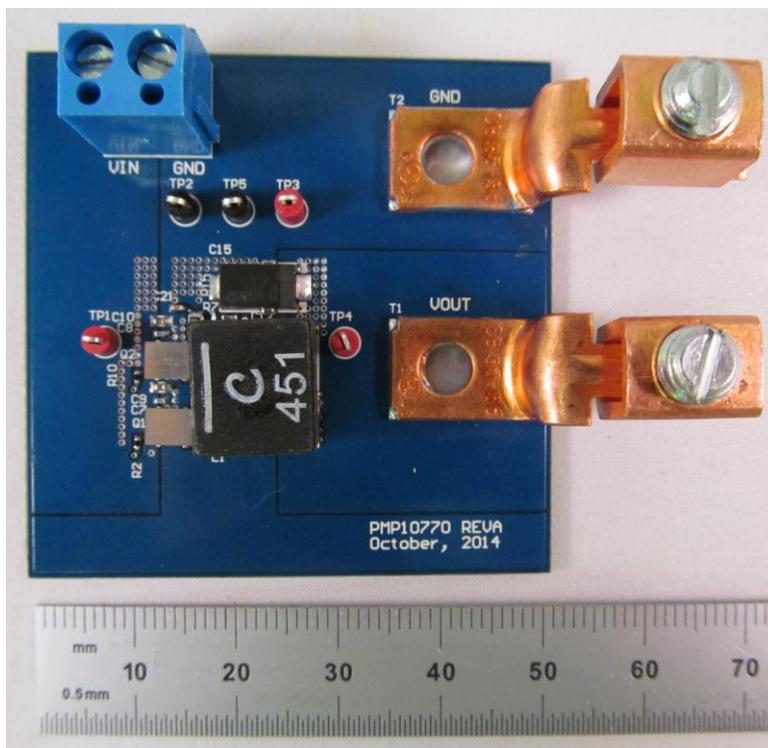


Front Side
Max Temp = 102.5C

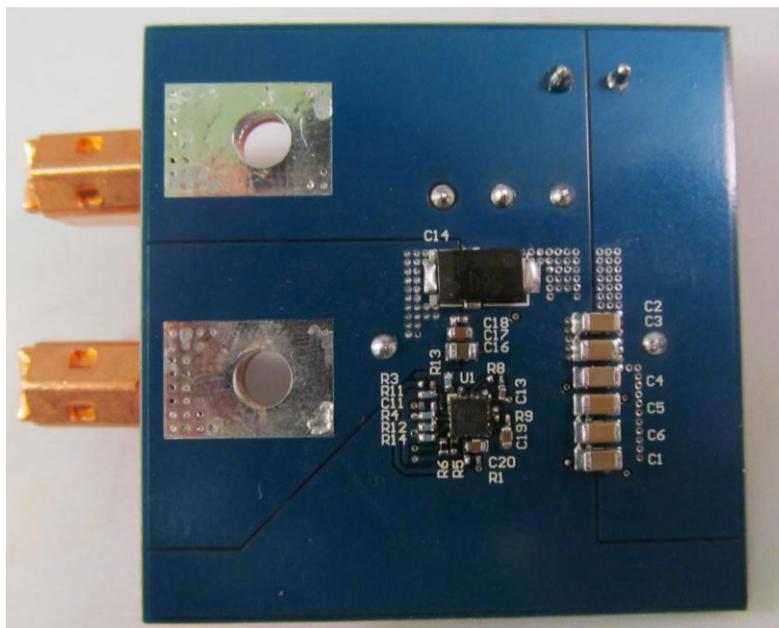


Back Side of EVM
Max Temp = 88.4C

9 EVM Photo



Front Side of EVM



Back Side of EVM

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