TI reference design number: PMP9464 Rev A

Input: 12V

Output: 0.9V @ 30A load

DC–DC Converter Test Results

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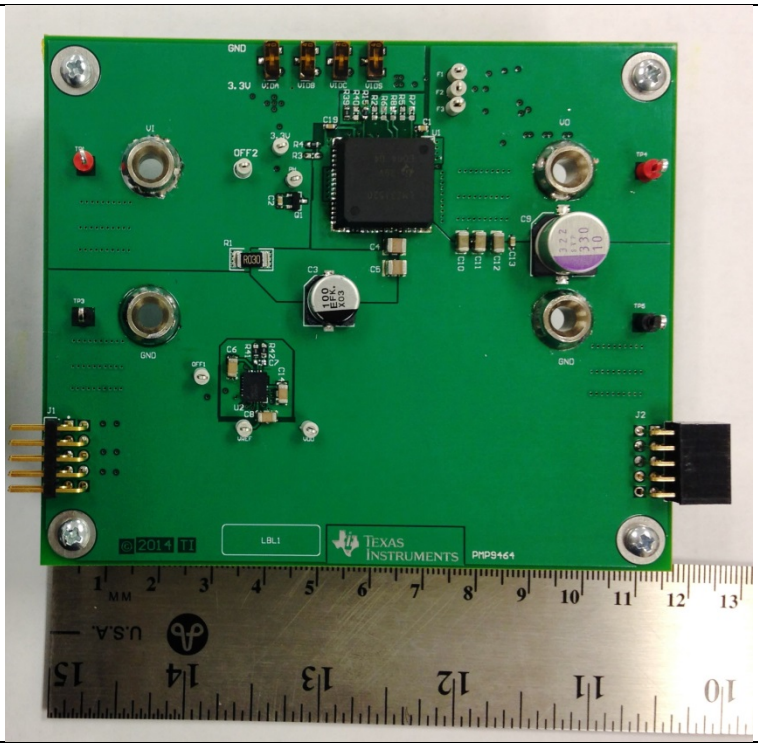
1. Circuit Description

PMP9464 utilizes the LMZ31530, a 30A SIMPLE SWITCHER® Power Module. This design has a LM25056 on the front end. This allows the user to monitor the real time values of Vin, Iin, Pin and Pout; as well as temperature and peak power. These values are reported via PMBus™/SMBus™/I2C. PMP9464 also enables the user to margin the output voltage setting, by slewing it up or down. This is done with the LM10011 VID programmable current DAC. The LP2951 supplies a 3.3V rail for the LM3881 power sequencer.

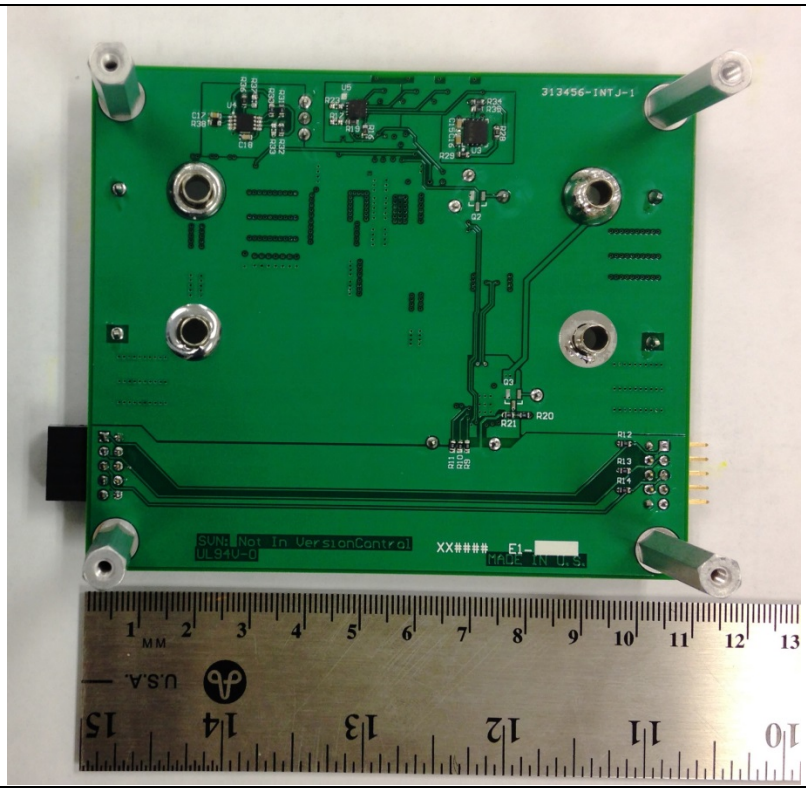
Vin Min.	**12VDC**
Vin Max.	**14VDC**
Vout	**0.9VDC**
Iout	**30A**
Target Switching Frequency	**500 kHz**

2. Fabrication

PMP9464 is a six layer board with overall dimensions of 3.4” (85mm) x 4.1” (102mm). The copper weight is 1oz on the outer layers and 0.5oz the inner layers.

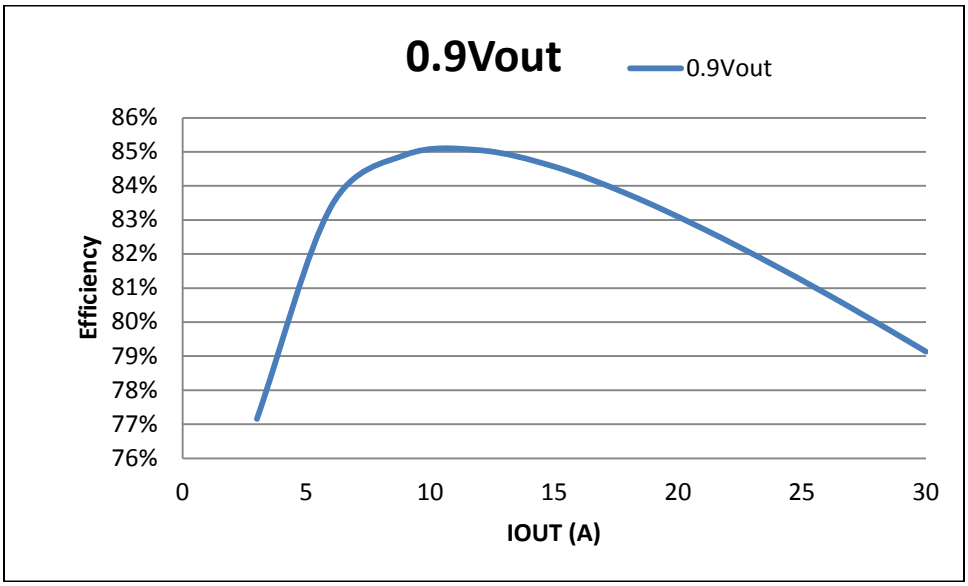


Top Layer



Bottom Layer

3. Efficiency

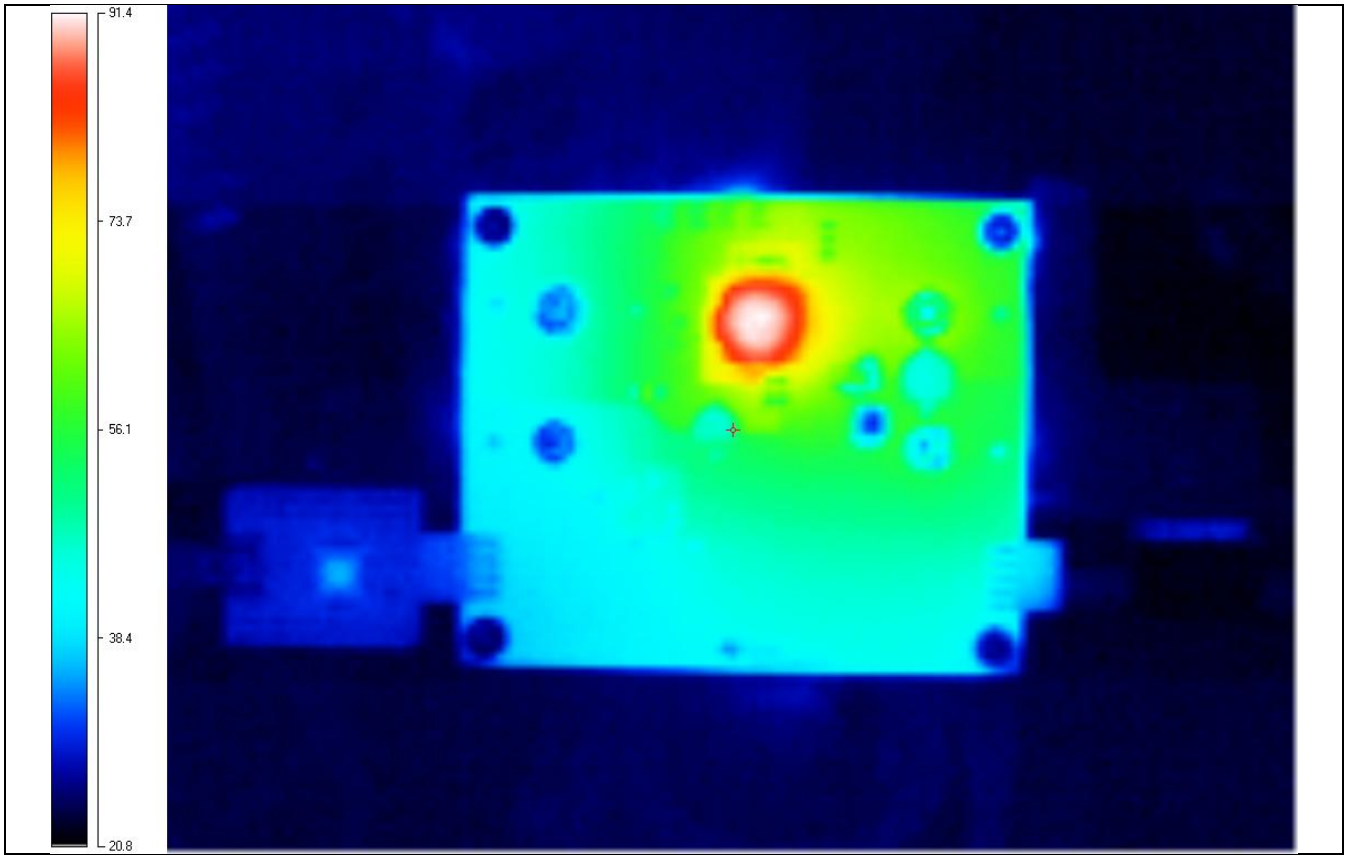


3.1 12VIN

Vin (V)	Iin (A)	Vout (V)	Iout (A)	Pin (W)	Pout (W)	Efficiency (%)	Losses (W)
12.018	0.036	0.907	0.000	0.435	0.000	0.06%	0.435
12.009	0.295	0.904	3.027	3.545	2.736	77.15%	0.810
11.999	0.546	0.903	6.057	6.555	5.467	83.40%	1.088
11.990	0.805	0.902	9.090	9.653	8.197	84.91%	1.456
11.981	1.072	0.901	12.126	12.846	10.925	85.05%	1.921
11.971	1.348	0.900	15.157	16.134	13.644	84.57%	2.490
11.961	1.633	0.899	18.190	19.537	16.362	83.75%	3.175
11.950	1.929	0.899	21.224	23.055	19.076	82.74%	3.979
11.939	2.236	0.898	24.255	26.690	21.784	81.62%	4.905
11.927	2.554	0.898	27.290	30.460	24.493	80.41%	5.967
11.916	2.885	0.897	30.325	34.373	27.200	79.13%	7.173

4. Thermal

4.1 Steady State Temperature, 12VIN and 0.9VOUT with a 30A load.

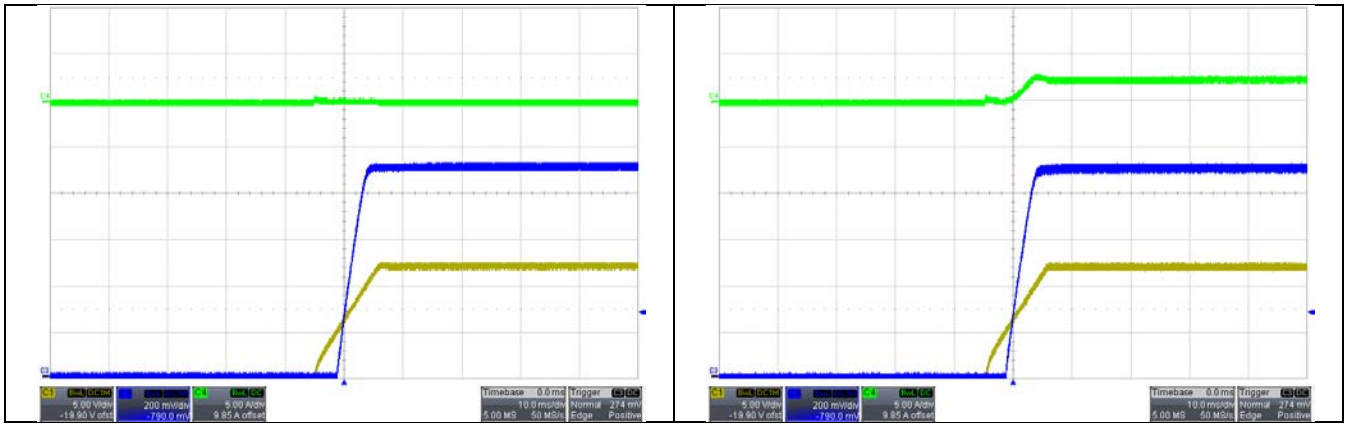


Top View

The warmest component is the LMZ31530. This image displays a 70°C temperature rise.

5. Power Up

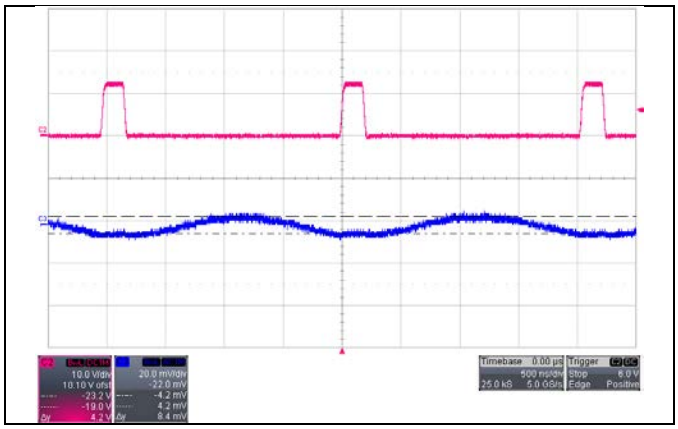
5.1 Power Up at 12VIN– No Load *30A Load*



Channel 1 VIN
Channel 3 VOUT
Channel 4 IIN

6. Switching and Ripple

6.1 12VIN @ 30A load

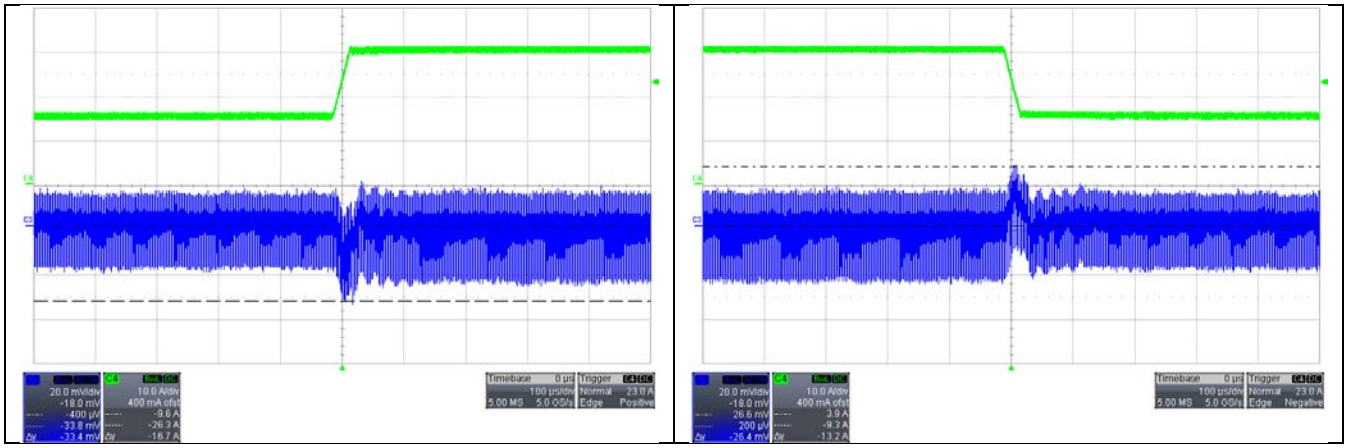


The cursors indicate 9mV ripple.

Channel 2 VSW
Channel 3 Vout

7. Transient Response

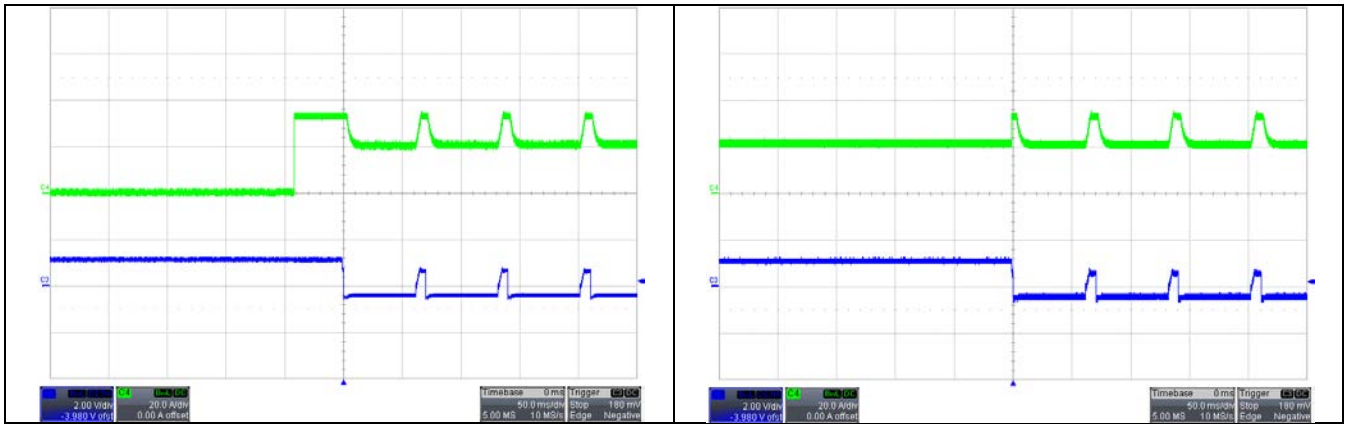
7.1 12VIN 15 - 30A Step, 100mA/µs, 100 Hz



Cursors indicate ~33mV deviation across output capacitor.

8.1 Short Circuit Tests

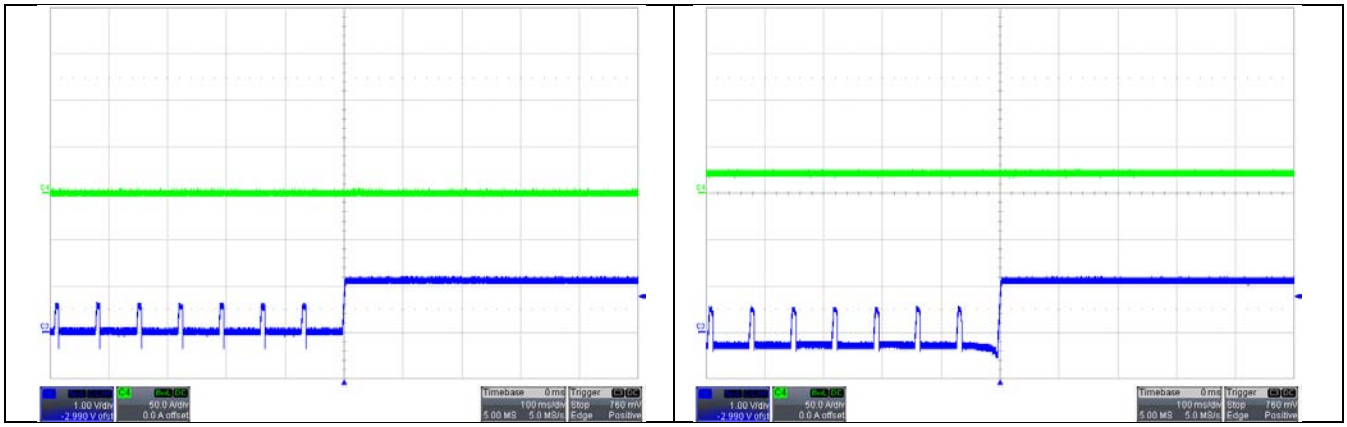
8.1 12VIN	No Load	30A load



Channel 3 VOUT
Channel 4 IOUT

9. Short Circuit Recovery Tests

9.1 12VIN No Load 30A load

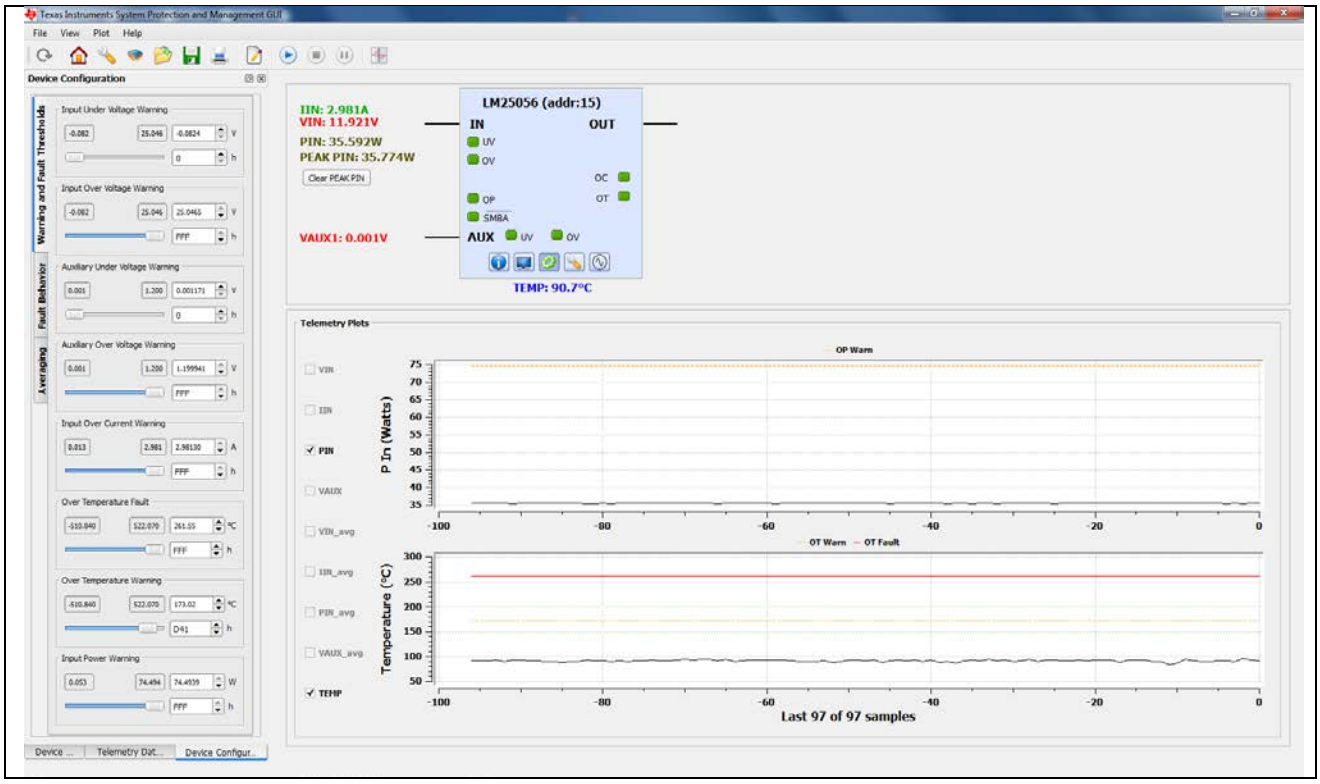


Channel 2 VOUT
Channel 4 IOUT

10. Graphical User Interface

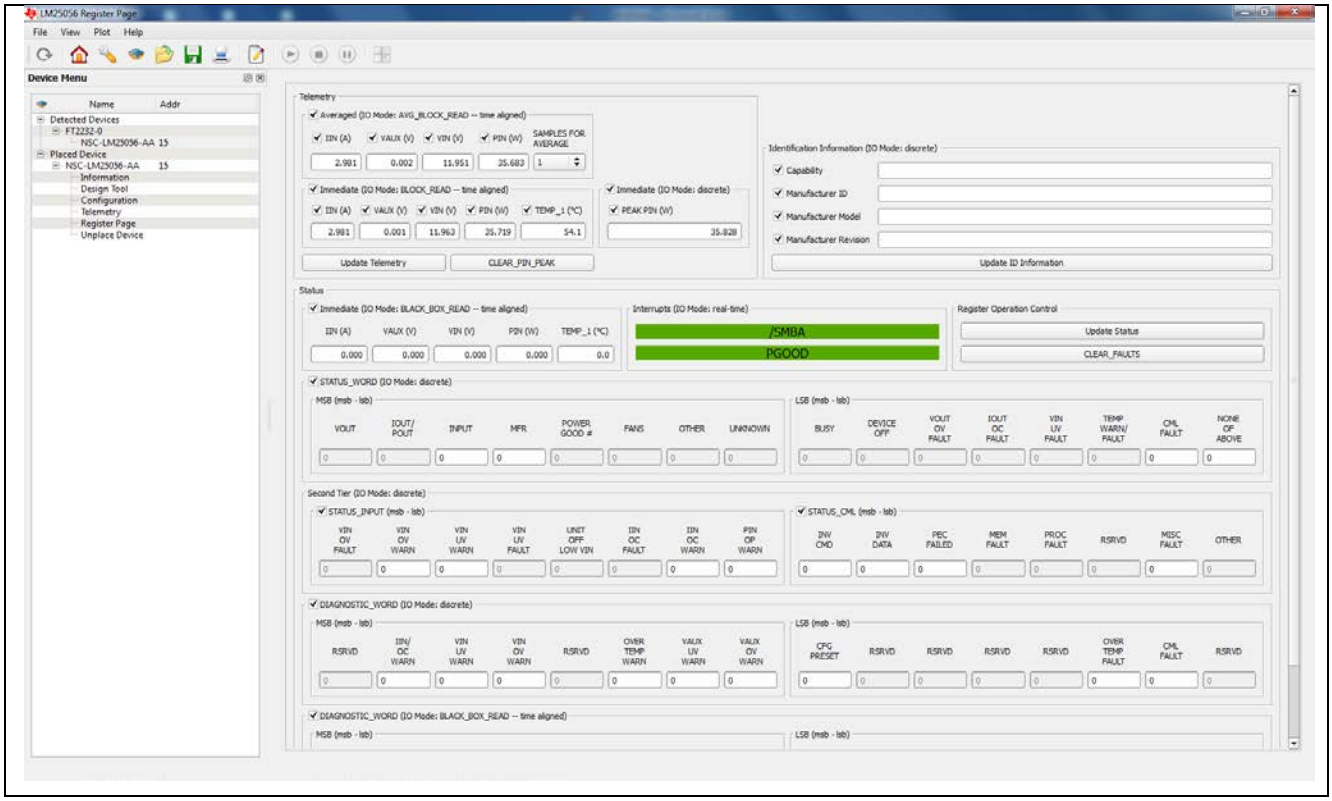
10.1

This is a screen capture of the GUI Home page at
12Vin and 0.9Vout at 30A



10.2

This is a screen capture of the GUI Register page at
12Vin and 0.9Vout at 30A



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