



LM5020-2 Boost Converter for 2 LED Strings

TI reference design number: PMP10521 REV A

Input: 55VDC to 135VDC

Output: 141 VDC @ 130mA

DC – DC Test Results

Table of Contents

1	Test Specifications.....	3
2	Circuit Description.....	3
3	Board Photos	3
4	Efficiency	5
4.1	Efficiency Results	5
4.2	Efficiency Data.....	5
5	Thermal	6
5.1	Thermal Image	6
6	Startup and Shut Down.....	7
6.1	Startup and Shut Down into 130mA Load	7
6.1	Startup and Shut Down into No Load	7
7	Switch Voltage and Sense Voltage Ripple.....	8
8	Load Transient Response.....	9
9	Control Loop Frequency Response	10
9.1	50 Ω and 133V Constant Voltage Load	10
9.2	10mA Constant Current Load	10
9.3	No Load	11

1 Test Specifications

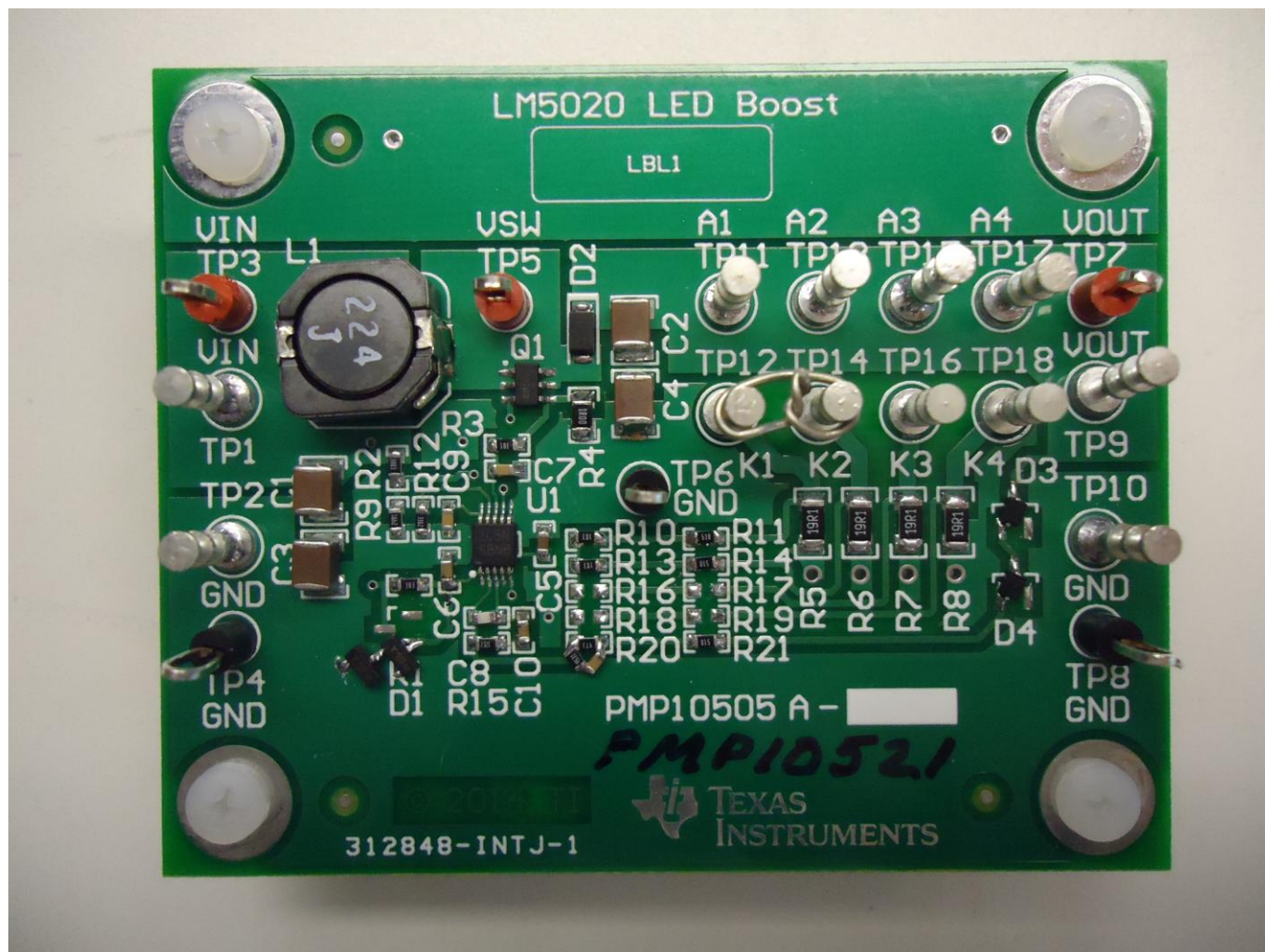
Vin Minimum	55 VDC
Vin Maximum	135 VDC
Vout	141 VDC
Iout	130mA

2 Circuit Description

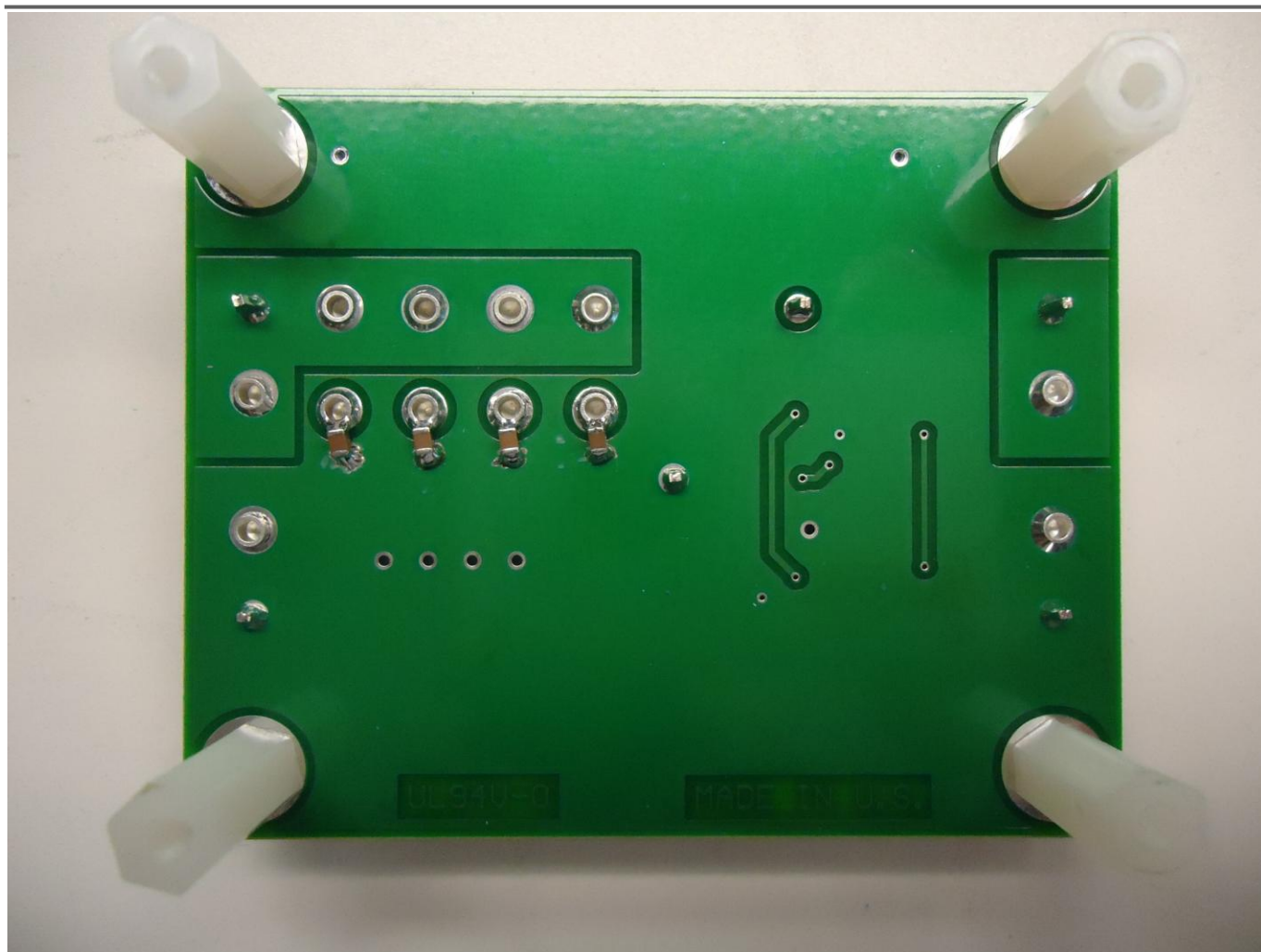
PMP10521 is a boost converter for LEDs which utilizes the LM5020-2 controller. The switching frequency is set to 100 kHz for high efficiency at a nominal output power of 18.5W. The design features switch current limiting, output over-voltage limiting and summing feedback for multiple LED strings. Constant current regulation allows for wide variation of output voltage.

3 Board Photos

The design is built on PMP10505 Rev A printed circuit board. This is a 2-layer PCB with 1 oz. copper. PCB dimensions are 2.75 x 2.2 inch.



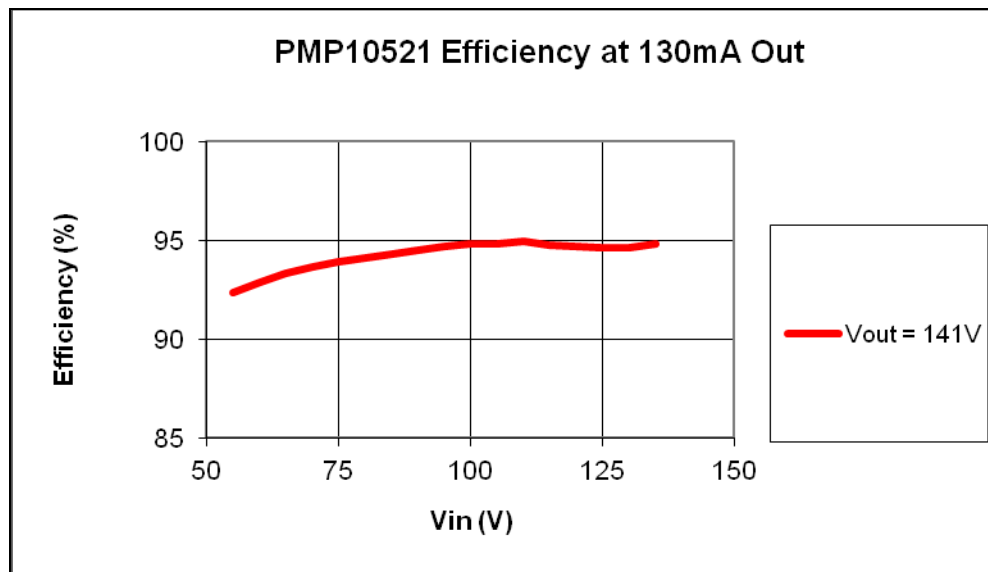
PMP10521 Test Results



PMP10521 Test Results

4 Efficiency

4.1 Efficiency Results



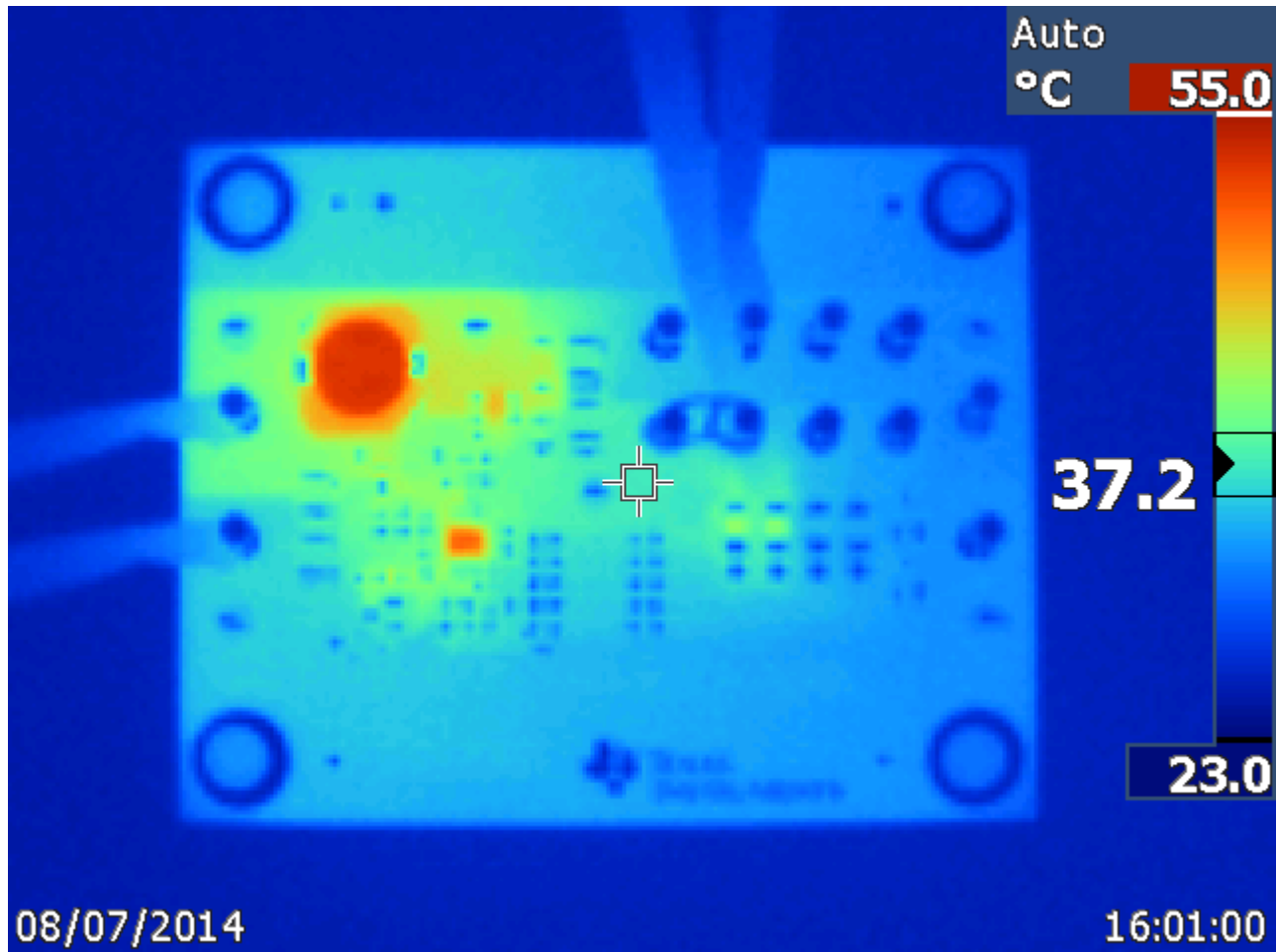
4.2 Efficiency Data

Vin (V)	Iin (A)	Vout (V)	Iout (A)	Pin (W)	Pout (W)	Pdis (W)	Efficiency (%)
54.970	0.3623	140.86	0.1306	19.92	18.40	1.52	92.371
59.968	0.3303	140.86	0.1306	19.81	18.40	1.41	92.876
64.976	0.3033	140.87	0.1306	19.71	18.40	1.31	93.355
69.980	0.2808	140.87	0.1306	19.65	18.40	1.25	93.625
74.984	0.2612	140.87	0.1306	19.59	18.40	1.19	93.933
79.982	0.2444	140.87	0.1306	19.55	18.40	1.15	94.117
84.988	0.2295	140.87	0.1306	19.50	18.40	1.11	94.324
89.993	0.2163	140.87	0.1306	19.47	18.40	1.07	94.514
94.990	0.2046	140.87	0.1306	19.43	18.40	1.04	94.663
99.993	0.1941	140.87	0.1306	19.41	18.40	1.01	94.791
104.992	0.1848	140.87	0.1306	19.40	18.40	1.00	94.821
109.998	0.1762	140.87	0.1306	19.38	18.40	0.98	94.923
115.000	0.1688	140.87	0.1306	19.41	18.40	1.01	94.774
120.010	0.1619	140.87	0.1306	19.43	18.40	1.03	94.689
125.000	0.1555	140.87	0.1306	19.44	18.40	1.04	94.650
129.990	0.1496	140.87	0.1306	19.45	18.40	1.05	94.606
135.000	0.1437	140.87	0.1306	19.40	18.40	1.00	94.836

5 Thermal

5.1 Thermal Image

85V input to 141V output 130mA load.

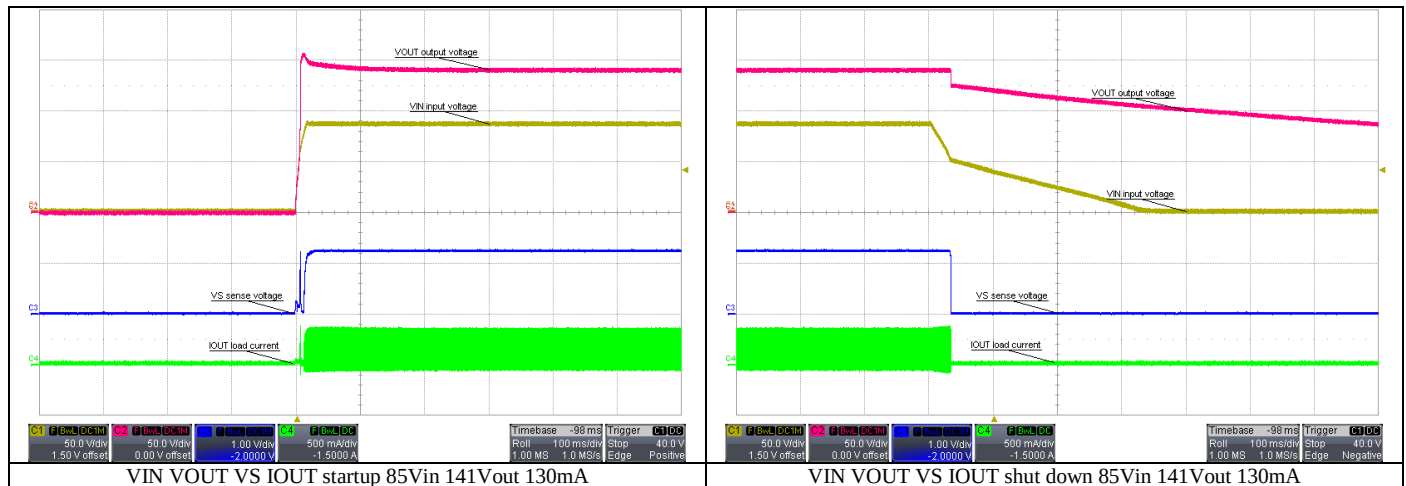


PMP10521 Test Results



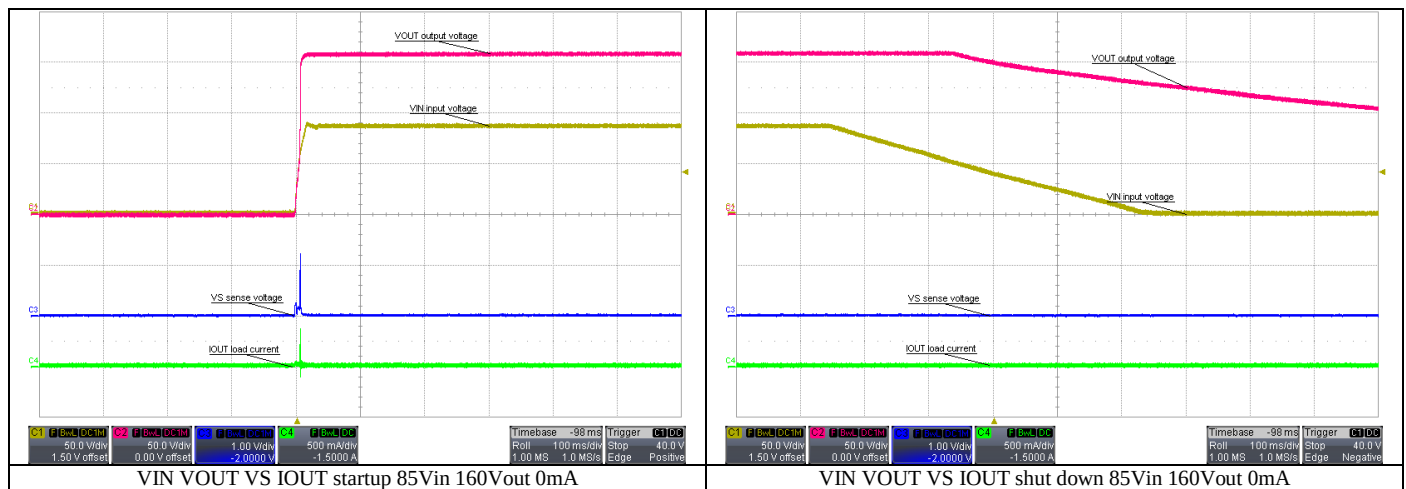
6 Startup and Shut Down

6.1 Startup and Shut Down into 130mA Load



6.1 Startup and Shut Down into No Load

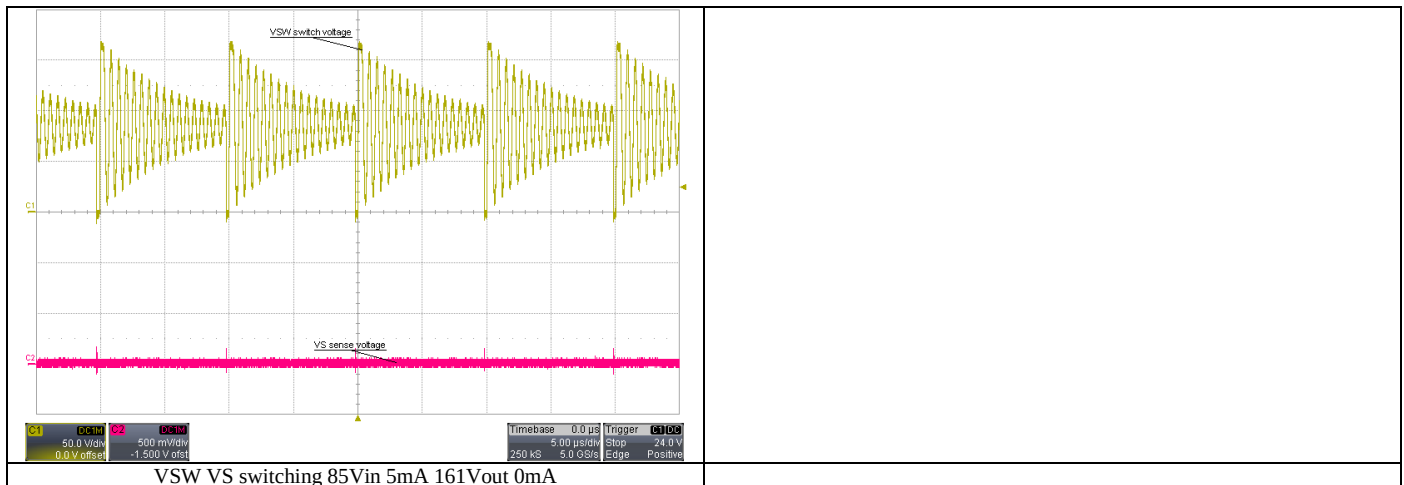
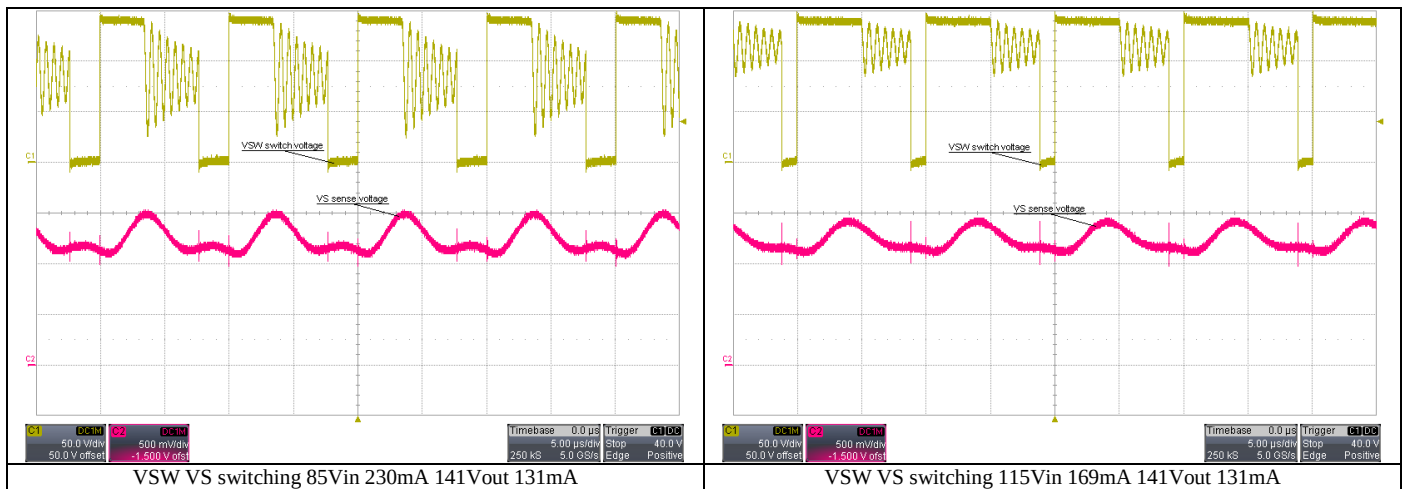
This demonstrates output over-voltage limiting at 160V.



PMP10521 Test Results



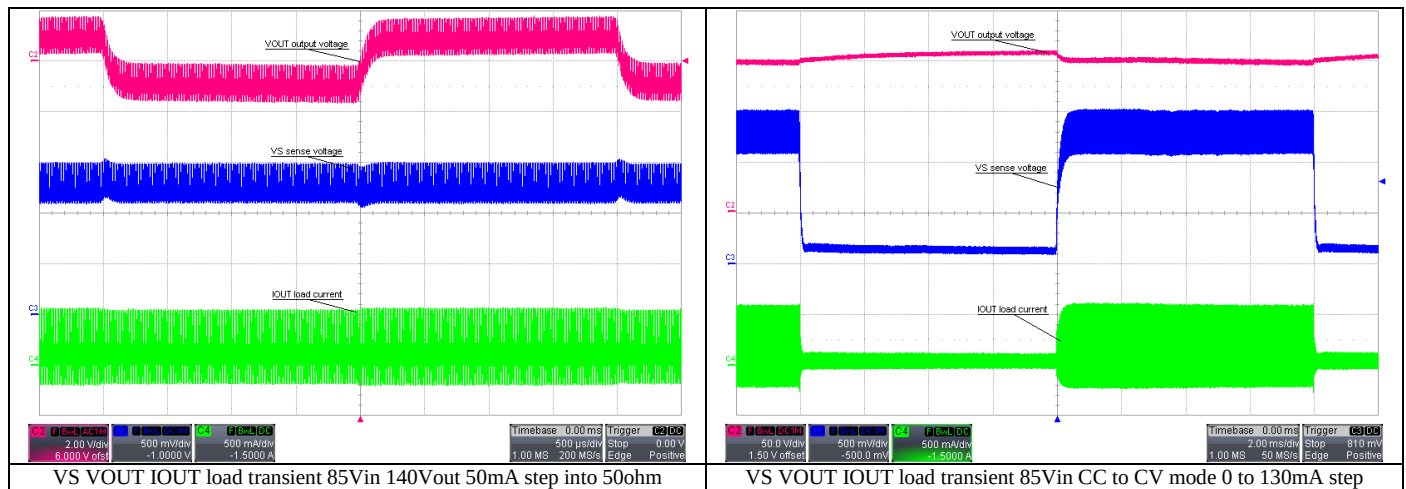
7 Switch Voltage and Sense Voltage Ripple



PMP10521 Test Results

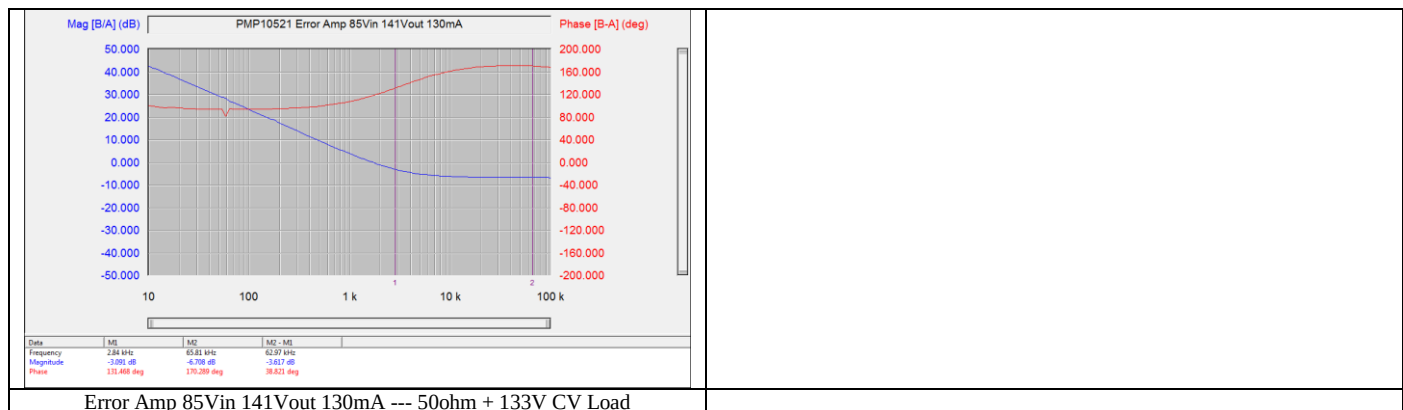
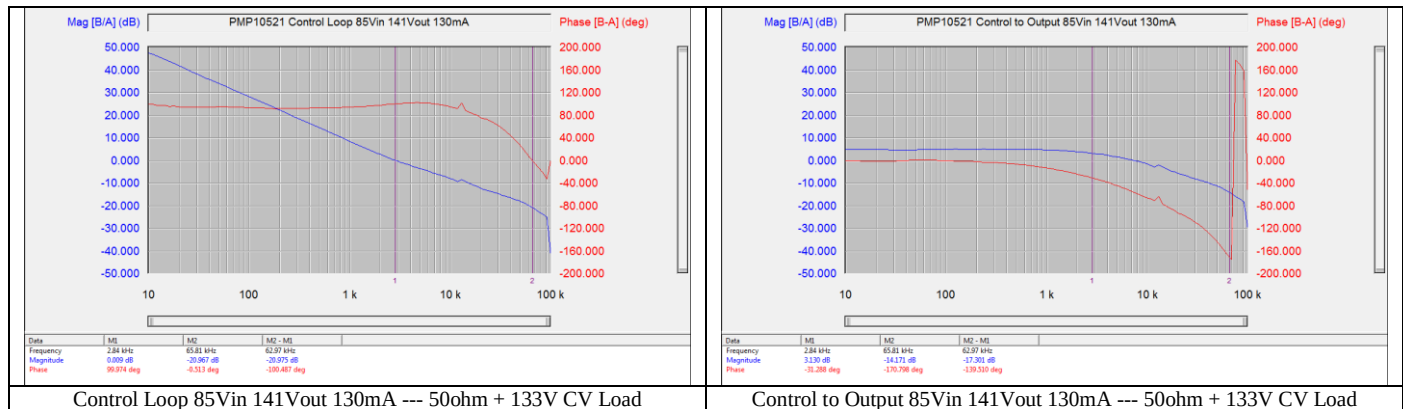


8 Load Transient Response

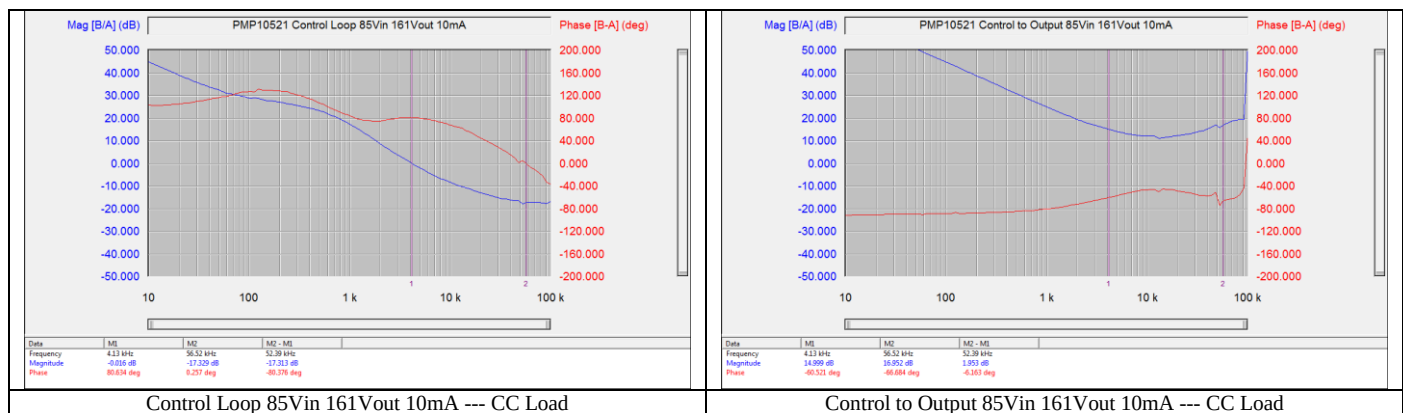


9 Control Loop Frequency Response

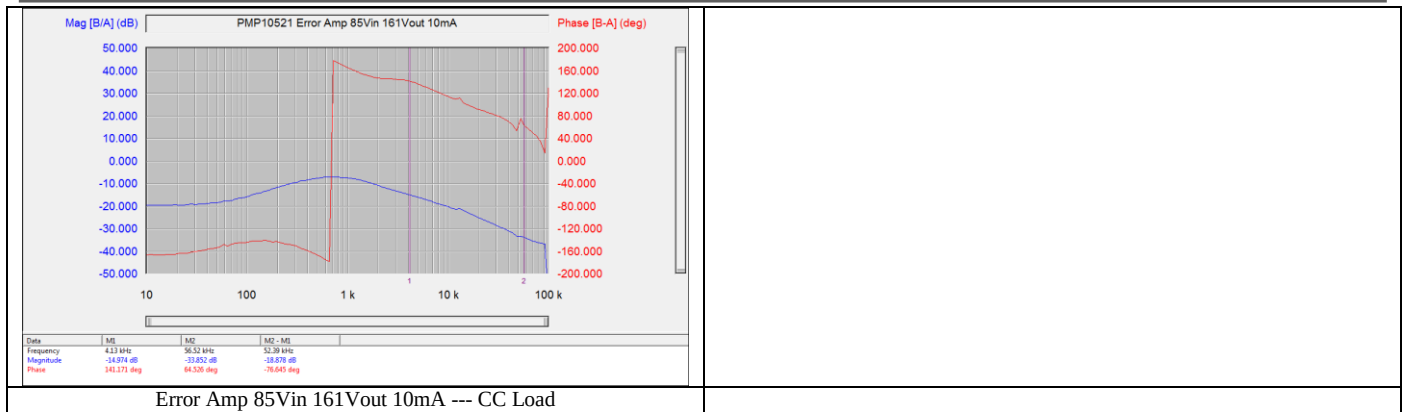
9.1 50Ω and 133V Constant Voltage Load



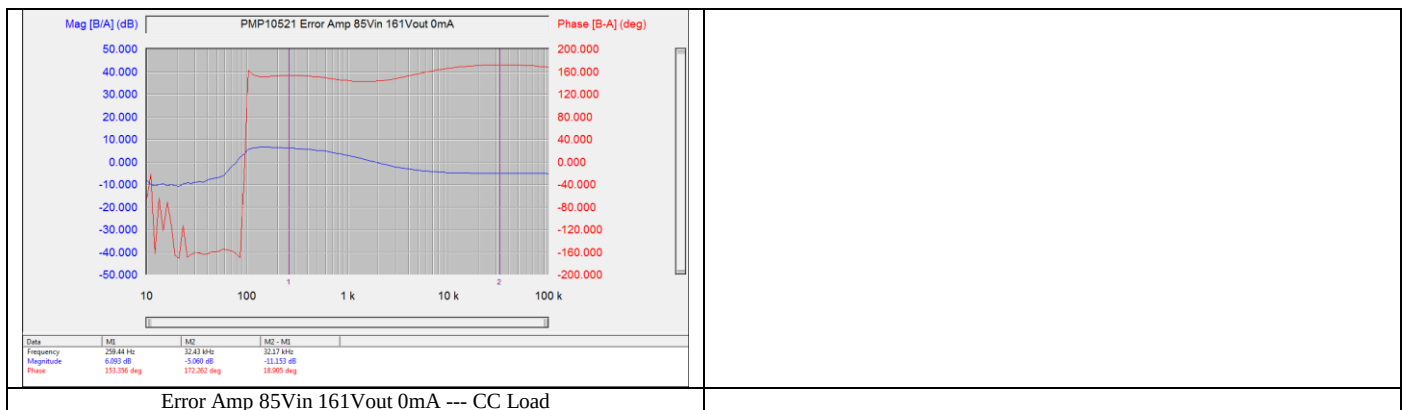
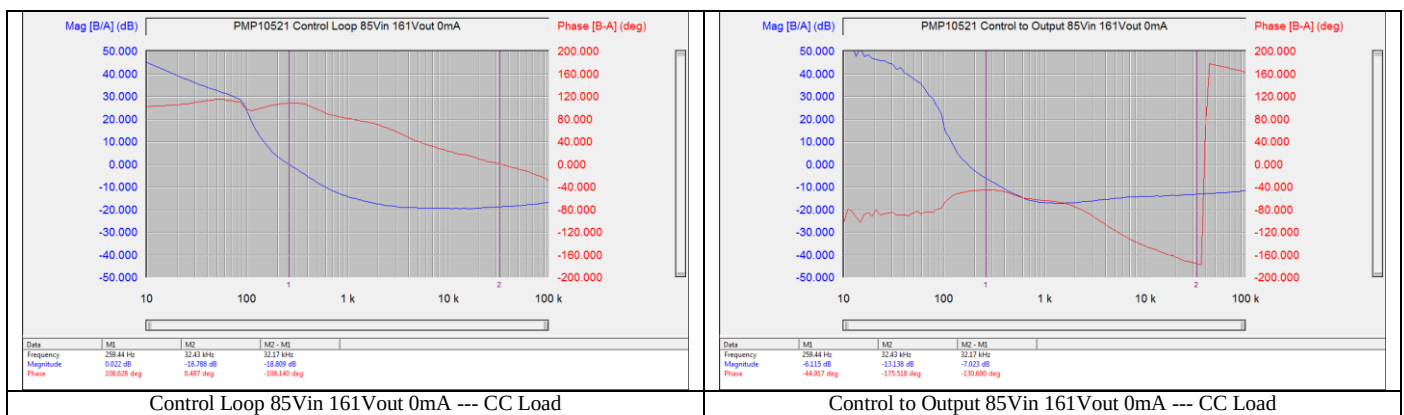
9.2 10mA Constant Current Load



PMP10521 Test Results



9.3 No Load



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