



**PMP5952: UCC28610, UCC24610 and TPS2540
Dual Output Universal USB Charger
2/17/11**

The following test report is for the PMP5952 project.

The tests performed were as follows:

A. PMP5952 - 5.25V@5A

1. Board Photo
2. Thermal Images
3. Turn-On (No Load)
4. Switching Waveforms (Full Load and No Load)
5. Output Voltage Ripple (Full Load and No Load)
6. Transient Response (1A to 2A)
7. Efficiency
8. Load Regulation
9. Bode Plot
10. USB Switch Protection

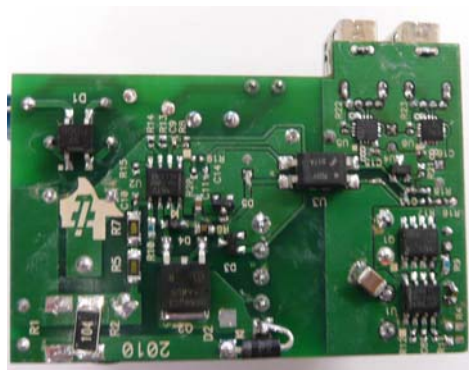
PMP5952 Test Results Rev. B

1 Board Photo – (PMP5952 - 5.25V@5A)

The photo below shows the PMP5952_REVA PCB. The board is 2.4in x 1.5in (6.1cm x 3.8cm).



Top of Board



Bottom of Board

2 Thermal Image – (PMP5952 - 5.25V@5A)

The image below shows the thermal profile of the PCB. The input voltage is 115VAC or 230VAC, the output is 5.25V @ 5A.



115VAC, Bottom of Board

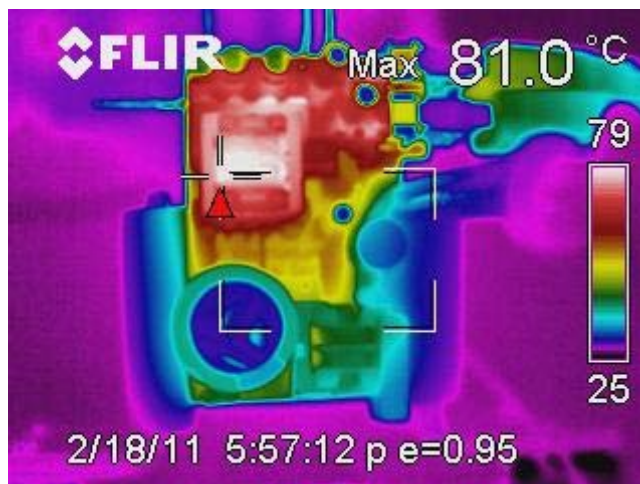


115VAC, Top of Board

PMP5952 Test Results Rev. B



230VAC, Bottom of Board



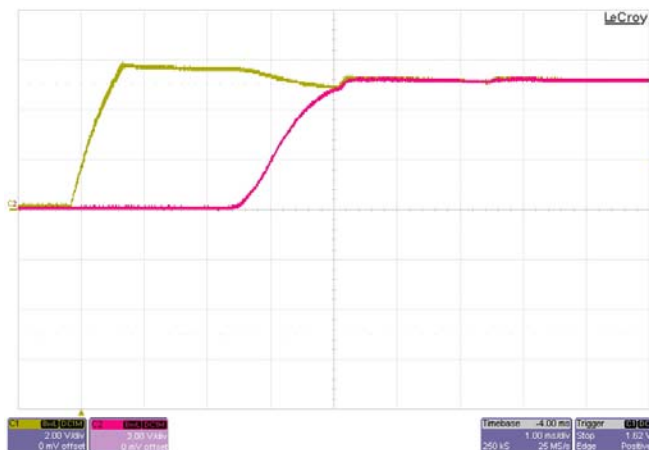
230VAC, Top of Board

3 Turn On – (PMP5952 - 5.25V No Load)

The photo below shows the startup waveform. The time-base is set to 1ms/Division.

Channel 1 – Yellow : 5.25V Output Before USB Switch – (2V/Division)

Channel 2 – Pink : 5.25V Output After USB Switch – (2V/Division)



115VAC Input



230VAC Input

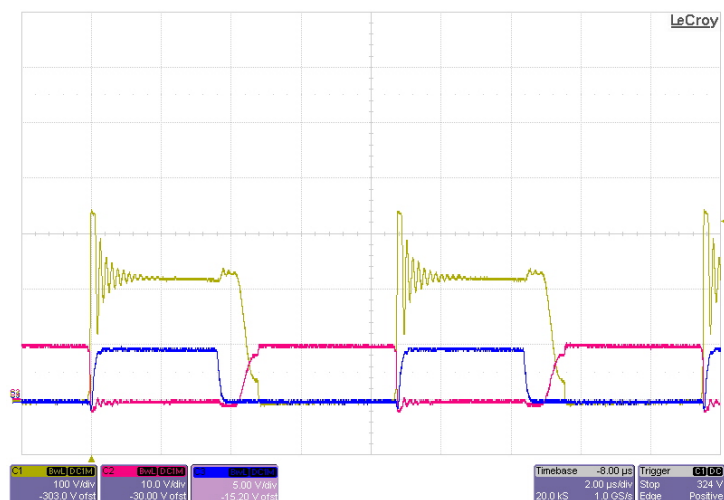
4 Switching Waveforms – (PMP5952 - 5.25V@5A)

The pictures below show the switching waveforms for the converter. The time base is 2us/division. The converter is fully loaded.

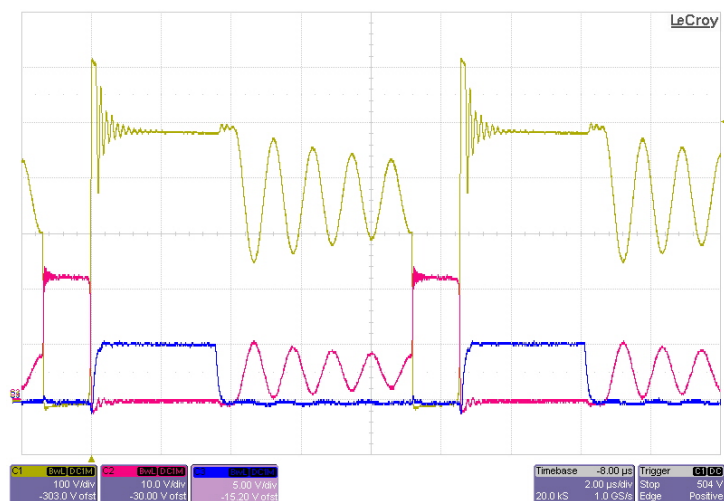
Channel 1 – Yellow : Primary FET Drain – (100V/Division)

Channel 2 – Pink : Sync FET Drain – (10V/Division)

Channel 3 – Blue : Sync FET Gate Drive – (5V/Division)



90VAC



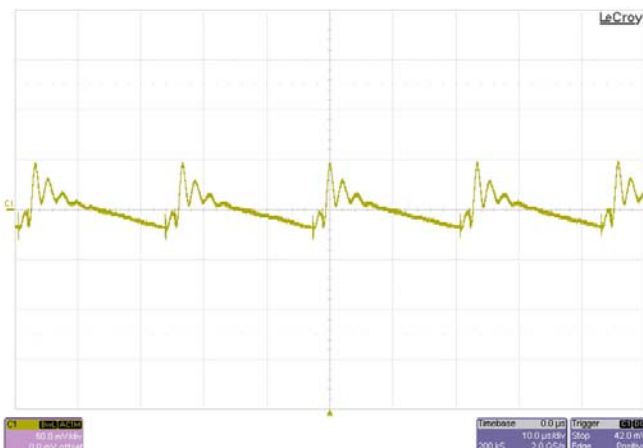
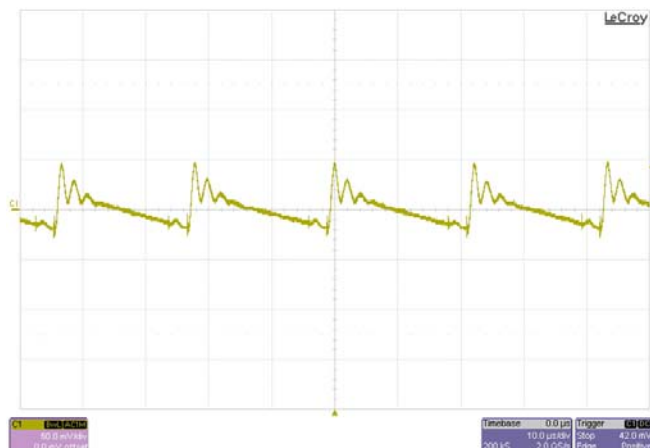
265VAC

PMP5952 Test Results Rev. B

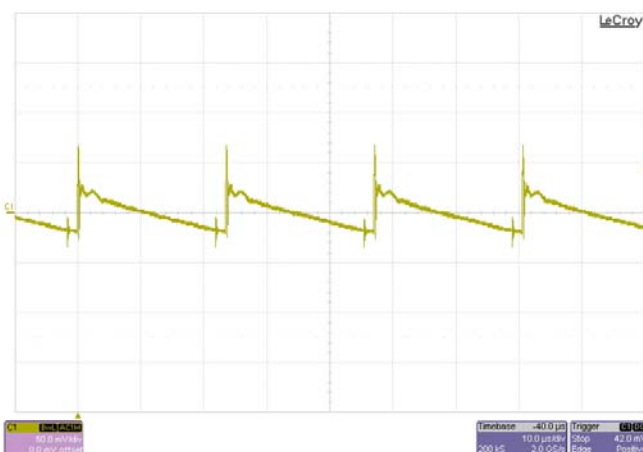
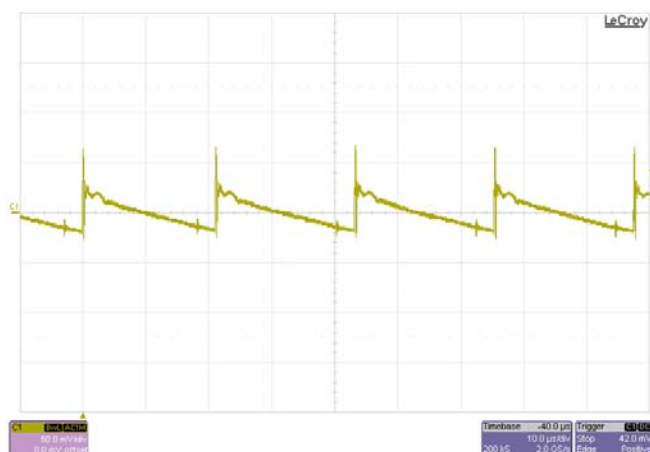
5 Output Voltage Ripple – (PMP5952 - 5.25V@5A)

The photos below show the output voltage ripple. The timebase is set to 10us/Division.

Channel 1 – Yellow : Output Voltage After USB Switch : (50mV/Division; AC Coupled)



Channel 1 – Yellow : Output Voltage Before USB Switch : (50mV/Division; AC Coupled)



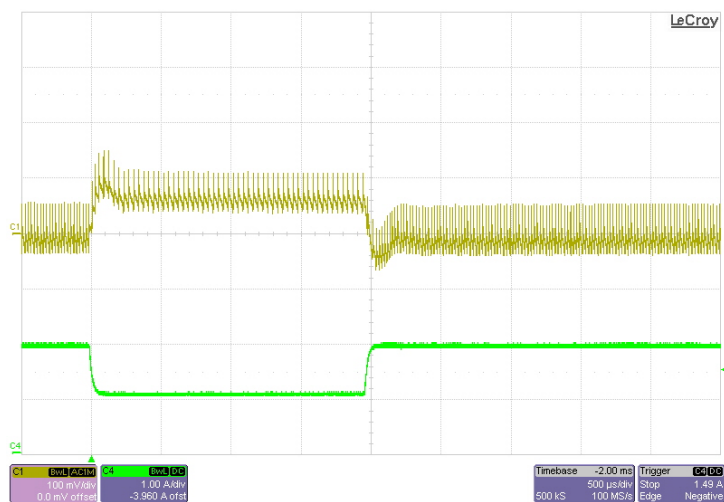
PMP5952 Test Results Rev. B

6 Transient Response – (PMP5952 - 5.25V@5A)

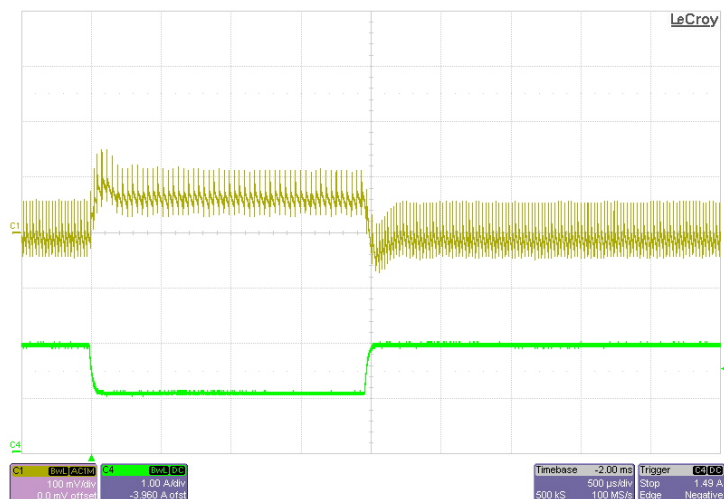
The transient response of the converter is shown in the figure below. The current is pulsed from 1A to 2A.

Channel 1 – Yellow : Output Voltage After USB Switch : (50mV/Division; AC Coupled)

Channel 4 – Green : Output Current : (1A/Division)



115VAC

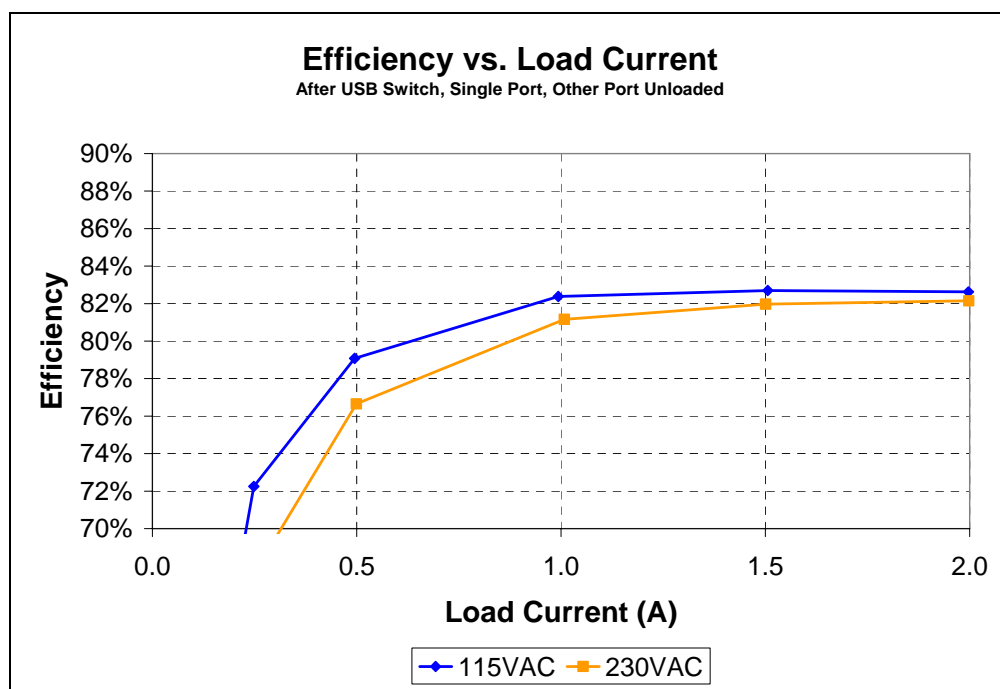
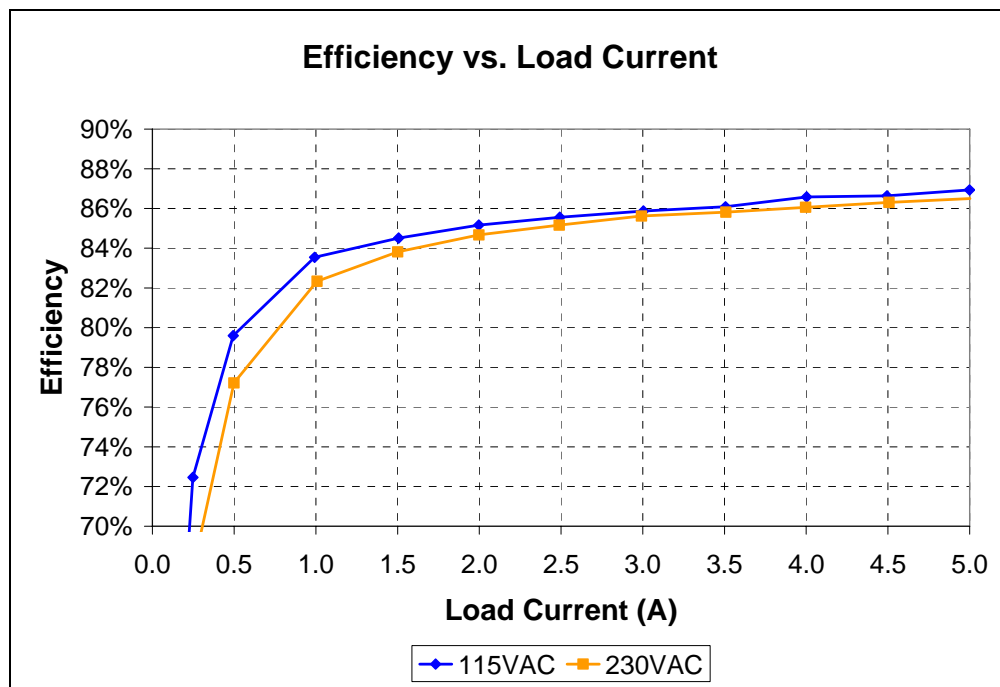


230VAC

7 Efficiency – (PMP5952 - 5.25V@5A)

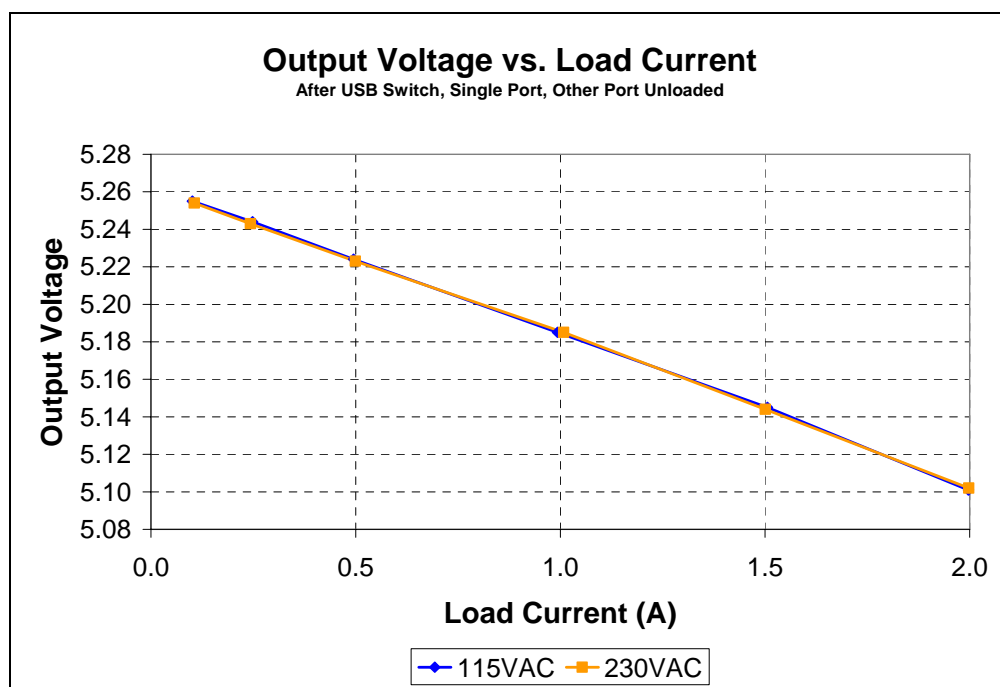
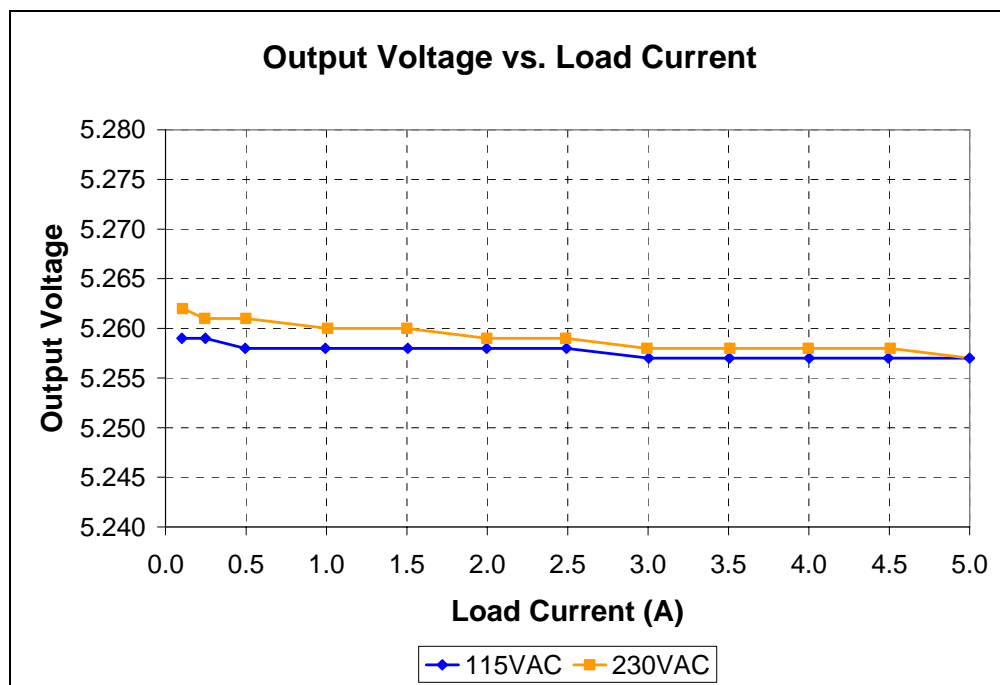
The efficiency of the converter is shown in the pictures below. The efficiency is measured before and after the USB switch.

The no load power was: 115VAC = 108mW; 230VAC = 250mW



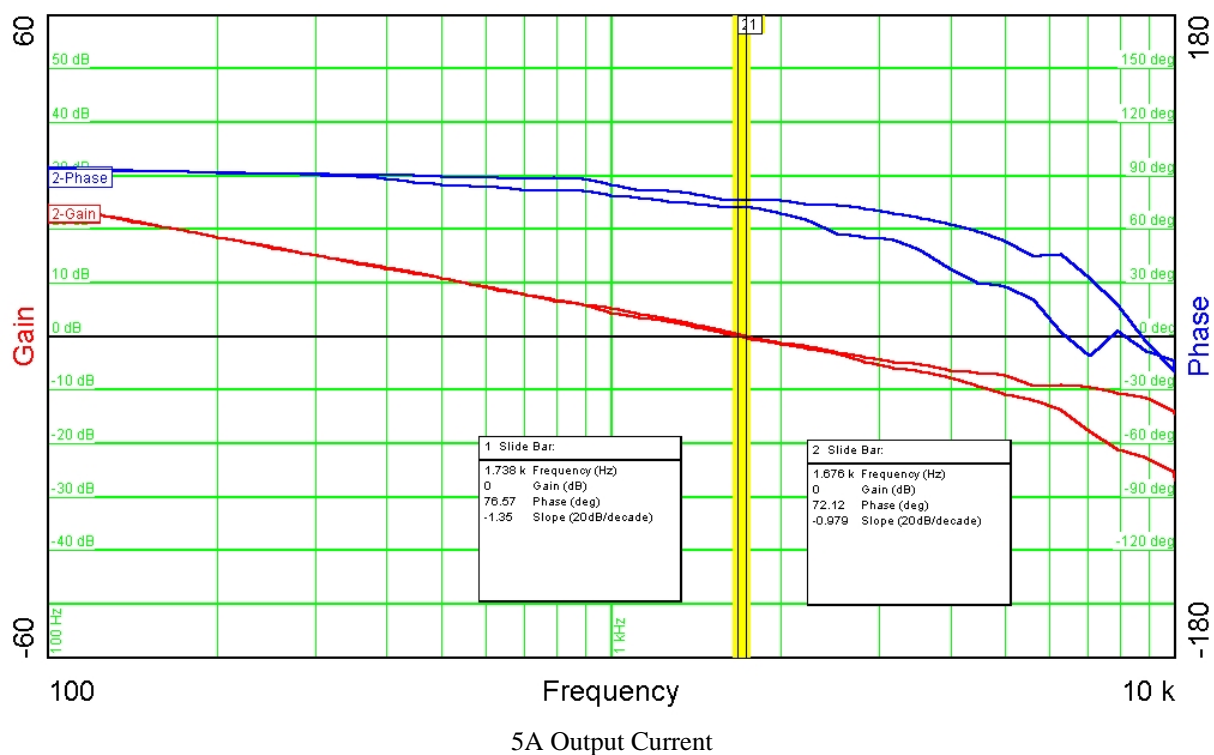
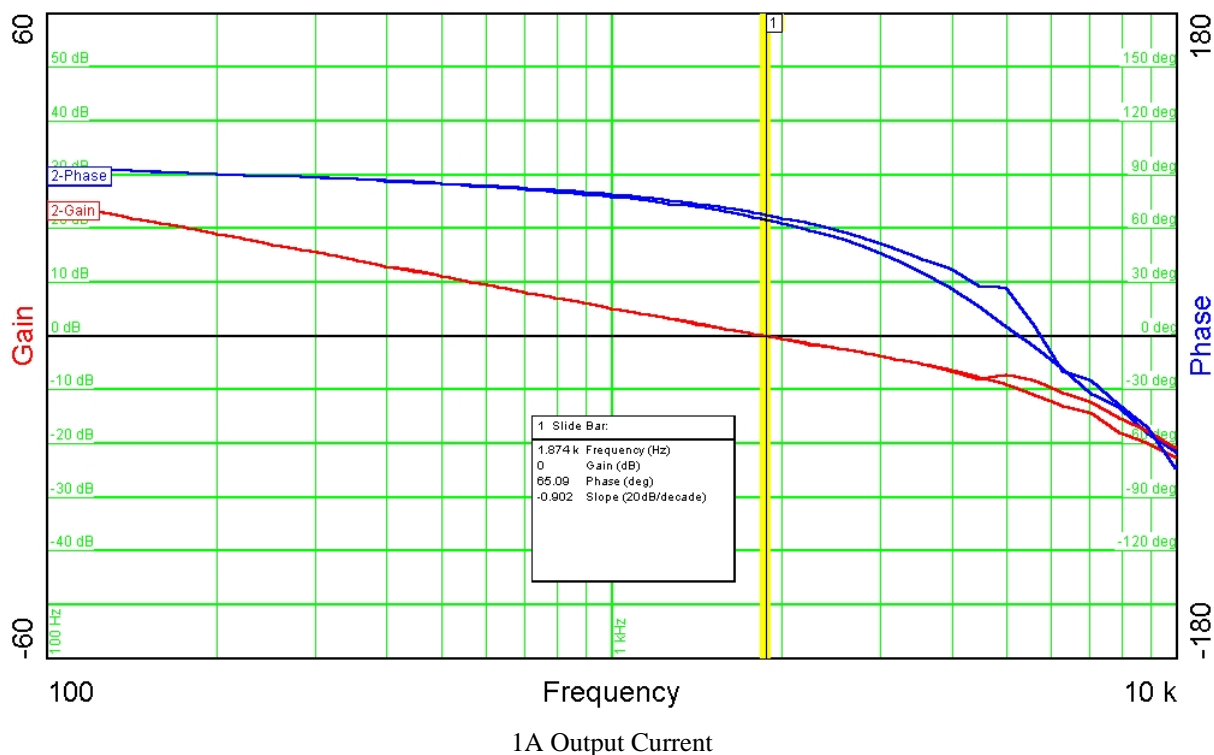
8 Load Regulation – (PMP5952 - 5.25V@5A)

The load regulation is shown in the figure below.



9 Bode Plot – (PMP5952 - 5.25V@5A)

The figures below show the loop response of the converter. The input is 150VDC or 300VDC.



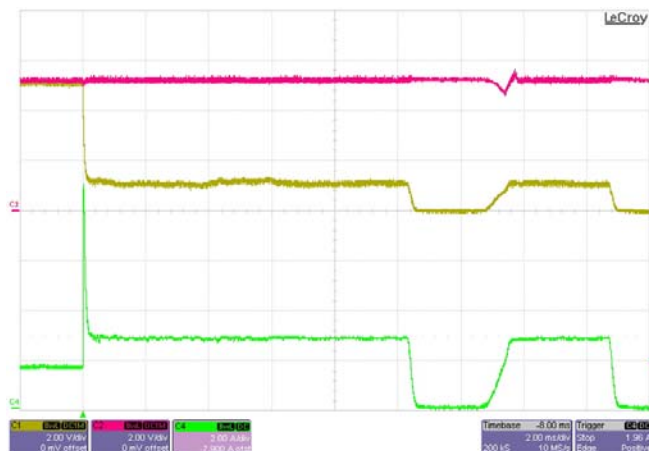
10 USB Switch Protection

The figures below show the current limit features of the TPS2540 USB Switch

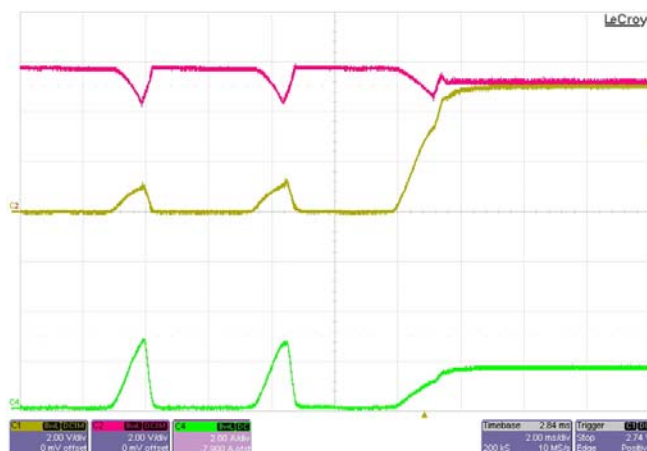
Channel 1 – Yellow : Output Voltage After USB Switch – (2V/Division)

Channel 2 – Pink : Output Voltage Before USB Switch – (2V/Division)

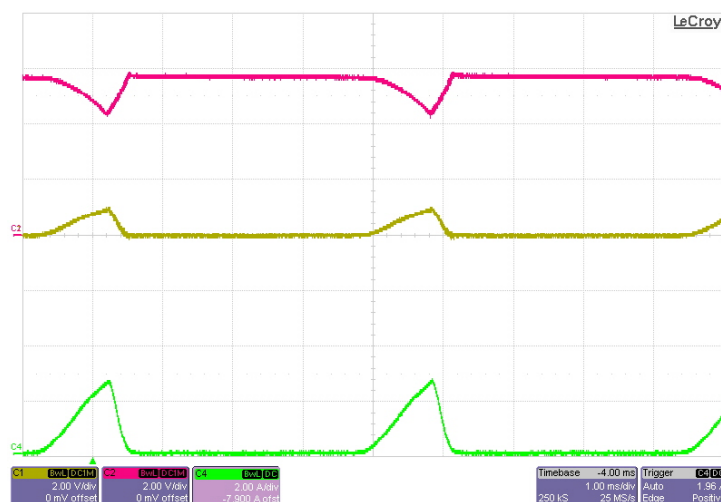
Channel 4 – Green : Output Current – (5V/Division)



Application of short circuit



Removal of short circuit



Continuous short circuit