11/14/13

Testing the TPS61202 circuit for USB charging

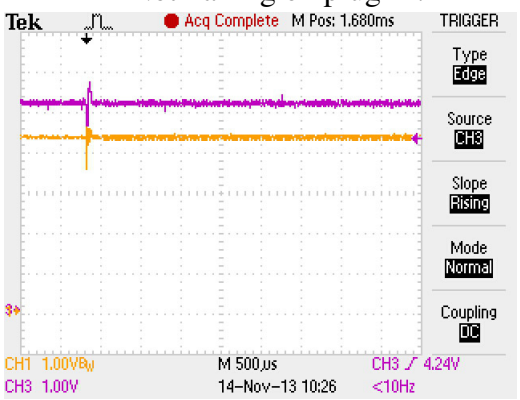
Purpose:
To characterize the 5V charging system and failure of chips in the standard use case.

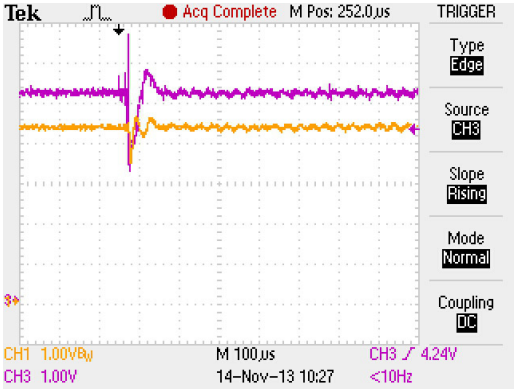
Executive Summary:
This test shows that the TPS61202 is not always capable of withstanding the phone load when it is plugged in, with a critical failure occurring in a smoked chip.

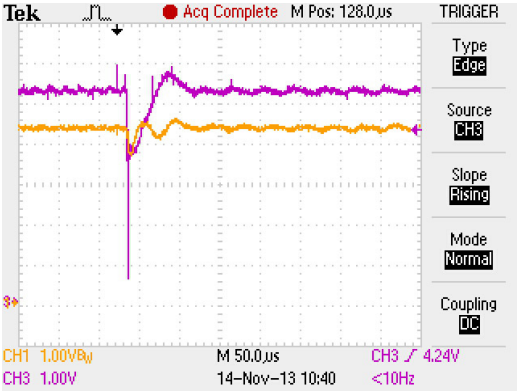
Procedure:
1. Connect the board to a scope to monitor various voltages and currents.
2. Use varying input sources to measure the response of the system.
3. Plug in the desired load multiple times and monitor the result.

Results:
The following results are shown based on their setup:
Input: 4.3V from a bench power supply with a 2A current limit
Output: Samsung phone at ~25% charge, which wants to take 1A of current. Note: same failure occurs on phones that only want to take 1A.
Ch1 (Yellow): Connected to the input
Ch 3 (Pink): Connected to the output

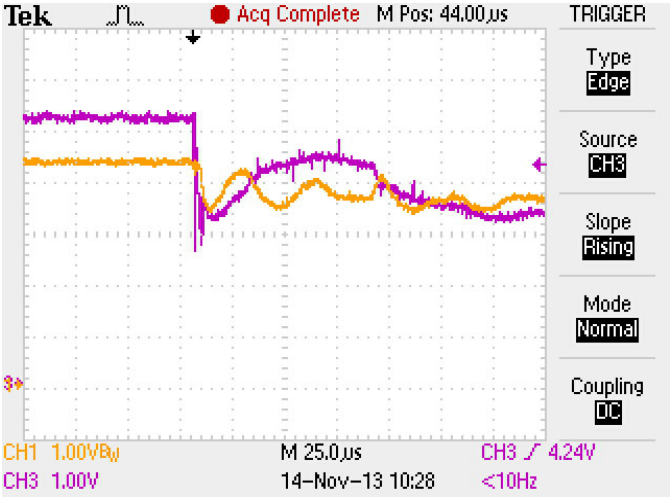
Not Failing on plug-in:





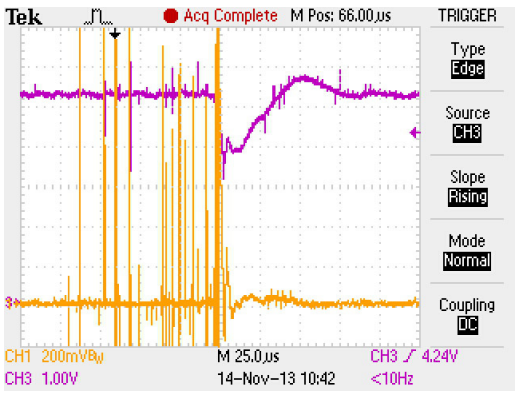


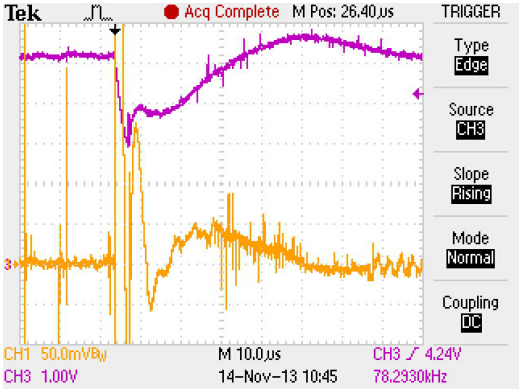
The follow shot is from an instance where the chip failed (smoked the chip):



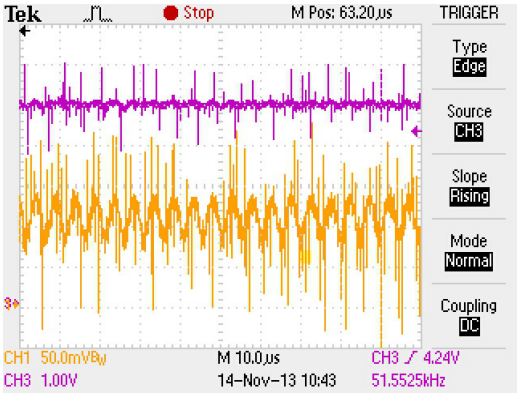
Input: 4.3V from a bench power supply with a 2A current limit
Output: Samsung phone at ~25% charge which wants to take 1A of current. with a 0.1 Ohm resistor in series. Note: same failure occurs on phones that only want to take 1A.
Ch1 (Yellow): Connected across the 0.1 Ohm resistor
Ch 3 (Pink): Connected to the output

Not Failing on plug-in:





Not failing in Steady State:



The follow shot is from an instance where the chip failed (smoked the chip):