Max1873 Battery Charger Board Test Procedure

1. The AT Tiny 85 is not needed during the initial testing and should not be installed.
2. Perform a thorough visual check with a magnifying glass or microscope.
3. Use your ohm meter to verify there are no shorts to ground on any power node.
4. Check that the Max1873 adjacent pins are not shorted together.
5. With the battery disconnected, apply 19 volts DC to the board, preferably with a bench supply so you can dial the current limit down. Verify all voltage nodes with a meter. This should include:

    - Vin 19V input
    - Battery+ charge voltage. This is dependent on which Max1873 part number is installed (R, S, or T) and resistor values for R5 and R6 (3.6V vs 3.7V cells).
    - Vload voltage (confirm the ideal diode circuit is working)
    - AT Tiny pin 8 (5.4 Volt regulator from Max1873)
    - The 3.3V pin from the linear regulator powering the 74HC132A.

6. Verify the digital latch circuit is working. On power up the Ps_En pin should be a logic high (3.3 volts). Momentarily touch the Sw_On pin to ground and verify the Ps_En pin is now a logic low. Momentarily touch the Off pin to 3.3 volts and verify the Ps_En pin is a logic high.
7. Disconnect the 19 volt DC source. Attach the battery to the charger board using a connector. This should tie the "system present" pin of the battery low with a 1K resistor and connect the positive and negative pins of the battery to the charger board. The battery voltage should be present at the Battery+ pin. If not, the battery may be bad or it may need a turn-on activation code over the SMBus. Use the “read_battery_loop.c” code described in the Instructable to see if the battery voltage can now be measured at the Battery+ pin and can be read over the SMBus.
8. Verify the battery voltage is present at the Vload pin – this checks that the "ideal diode" is working.
9. With the battery still connected, connect the 19 volt DC source and measure the battery voltage. Make sure it does not exceed the voltage rating for the battery. Measure the charge current at the Monitor test point. It should be about 1 volt when charging at 1 amp. If the battery voltage is correct but the charging current is near zero, use the “read_battery_loop.c” code described in the Instructable to enable charging. Monitor the battery temperature at all times while charging either by feel or with a temperature probe.
10. Once the battery charger is working properly, disconnect the 19V input and install a programmed AT Tiny 85. Connect 19 volts to the input and confirm normal battery charging operation. You may need to adjust the code in the Tiny for the following:

    - Stop charging when at 100% SOC.
    - Stop charging if the temperature rise is too high.
    - Stop charging if the total time is too long.
    - Stop charging if the Pi_Control input pin is at 3.3 volts.