

DESCRIPTION

Demonstration circuit DC606 is single cell Li-Ion linear charger in a SOT-23. Charge rates as high as 700mA can be achieved. The user is provided with two control jumpers to select between ON/OFF and 450mA/700mA charge rates. The reduced charge rate is suitable for USB applica-

tions. A charge LED illuminates while the charger is charging the battery.

Design files for this circuit board are available. Call the LTC factory.

Table 1. Performance Summary

| PARAMETER | CONDITION | VALUE |
|--------------------------|---------------------------------------|--------------|
| Input Voltage | | 4.25V - 6.5V |
| I _{out} | 450mA selected V _{bat} =3.6V | 450mA +- 7% |
| I _{out} | 700mA selected V _{bat} =3.6V | 700mA +-7% |
| Float Voltage | V _{in} =5V | 4.20v+-1% |
| Trickle Charge Threshold | V _{IN} = 5V | 2.9V +-0.05V |
| Recharge Threshold | V _{in} 5V | 4.05V+-50mV |

OPERATING PRINCIPLES

Demo DC606 is a simple single cell Li-Ion charger. The demo features the LTC4056-4.2 charger IC. This charger implements a constant current, and constant voltage charge scheme. Charge termination is based on a timer. A topping-off charge will be applied if the cell voltage falls to 4.05V to insure long-term charge maintenance. Deeply discharged cells are conditioned with a low

C/50 trickle current until the cell voltage reaches 2.9V whereupon full charge current is applied. A charge LED is provided that illuminates every time the charger is charging the battery. The peak charge current is jumper selectable at either 700mA or 450mA. The 450mA rate is intended for USB applications.

QUICK START PROCEDURE

Demonstration circuit 606 is easy to set up to evaluate the performance of the LTC4056-4.2. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Use the jumper provided to select the desired charge rate 450mA or 700mA. Verify that the Charger Enable jumper is set to the ON position.
2. With power off, connect the meters and input power supply as shown in Figure 1.

3. Connect the demo board to the battery simulator as shown in Figure 1.

4. Set the battery simulator voltage to zero, slowly increase the input voltage. When the supply voltage exceeds 4.5V the charger should activate and the charge LED will illuminate.

NOTE: Make sure that the input voltage does not exceed 6.5V.

5. Note that so long as the battery voltage is under the Trickle Charge threshold of 2.9V the charge

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT DC606

LI-ION BATTERY CHARGER IN SOT-23

- current is about 2% of the selected charge current
- Increase the battery voltage to about 3V and note that the charge current has increased to the jumper programmed current, either 450 or 700mA. This is the constant current region of the charging cycle
 - Continue to increase the battery voltage, as the battery voltage approaches the float voltage of 4.2V the charge current will begin to drop. This is the constant voltage region of operation.
 - Wait 3 hours. The LED will extinguish as the charger terminates. The termination timeout can be reduced to 18 minutes by substituting a 100nF cap for C2.
 - Now slowly decrease the battery voltage as the battery voltage reaches about 4.05V, a new charging cycle should begin.
 - Place the Charger Enable jumper in the OFF position. Note that the battery current draw is extremely low (approx 1uA) and that the supply current draw is low (approx 35uA).

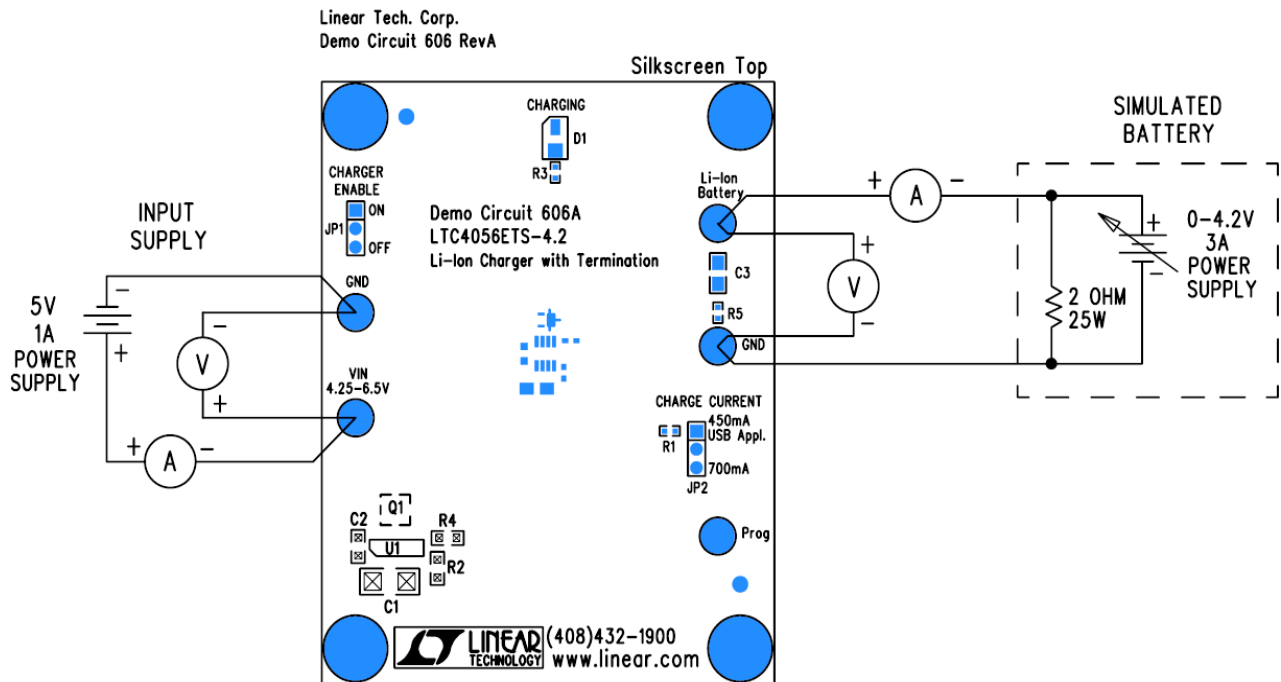
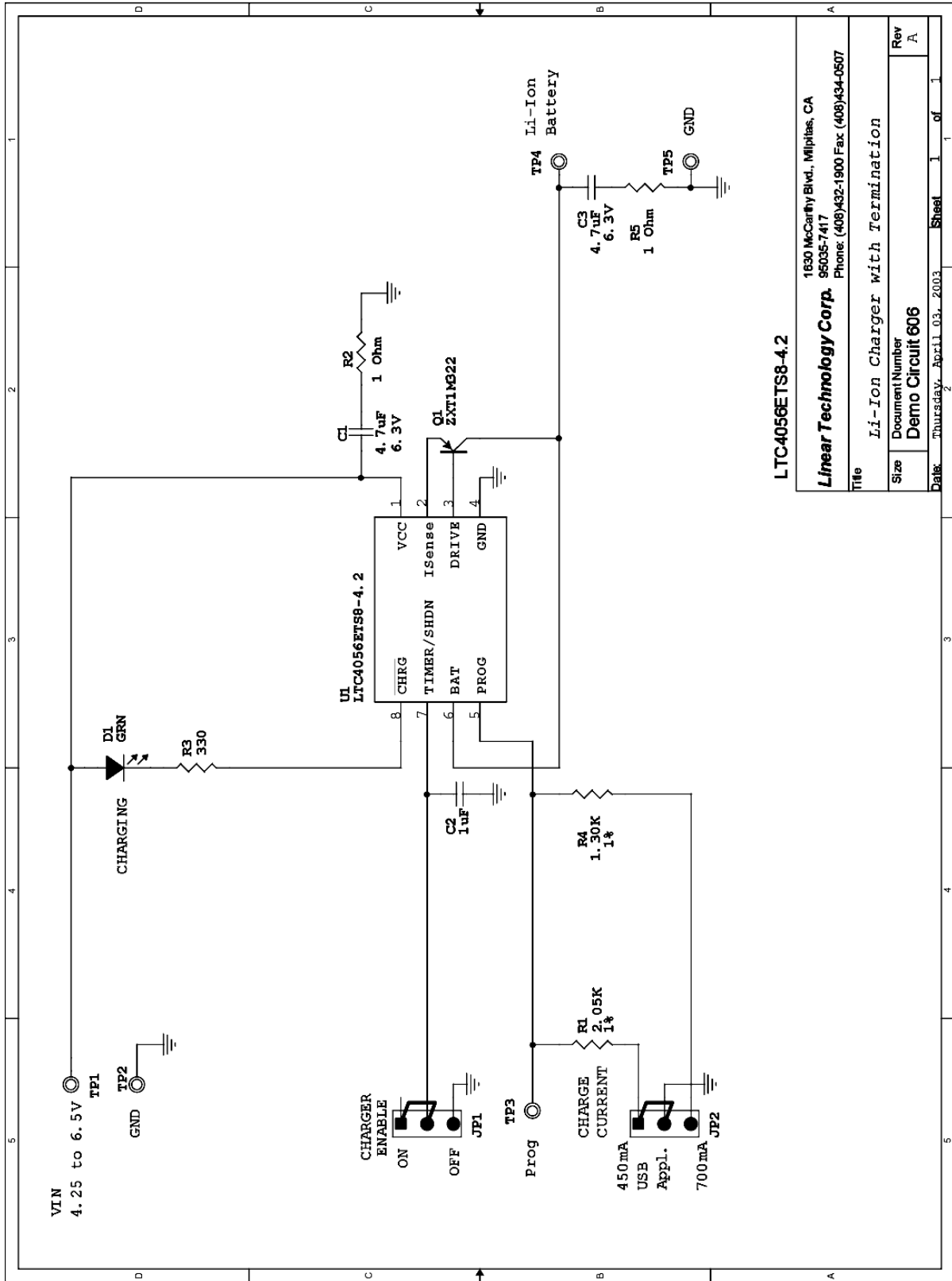


Figure 1. Proper Measurement Equipment Setup

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LI-ION BATTERY CHARGER IN SOT-23



LTC4056ETS8-4.2

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| Linear Technology Corp. | |
| Title | Li-Ion Charger with Termination |
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