

DESCRIPTION

Demonstration circuit 532 is a flexible one or two cell Li-ion battery charger and DC/DC converter. Power is input to the circuit via an adapter input. This power is used to both charge a battery and provide a regulated DC output of 3.3V. In the event that the input power is removed, the battery supports operation of the 3.3V output. The demo card supports via jumper se-

lection either 4.1V or 4.2V cell chemistries and either one or two cell systems. It is one of the few circuits that can charge an 8.2V battery from a 5V adapter.

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

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Table 1. Performance Summary

PARAMETER	CONDITION	VALUE
Input Voltage		3.5-6.5V
I_{OUT}	$V_{IN} = 5V$, $V_{BAT} = 7.2V$	1000mA \pm 7%
Float Voltage	$V_{IN} = 5V$	\pm 1%
Trickle Charge Threshold	$V_{IN} = 5V$	2.7V per cell
C/10 detection	$V_{IN} = 5V$ $V_{BAT} = 4.2$	75mA-150mA
Recharge Threshold	$V_{IN} = 5V$	$V_{FLOAT} - 200mV$
Linear Regulator Output voltage	$V_{IN} = 5V$ $I_{OUT} = 400mA$	3.3V \pm 2%

OPERATING PRINCIPLES

DC532 is a switch mode constant current, constant voltage timer terminated battery charger. Figure 1 shows a block diagram of the basic circuit. Input voltages of from 3.5 to 6.5V are converted into a charge current of up to 1000mA into an 8.4V battery using a synchronous flyback converter. A 3.3V output is provided via a linear regulator from the adapter in-

put. When the adapter is removed, the converter operates “backwards” discharging the battery by exploiting the bi-directional properties of synchronous converters in order to provide power to the linear regulator. Jumpers are provided to allow the user to easily configure the demo card to their system requirements.

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 532

REGULATOR / BATTERY CHARGER CONTROLLER

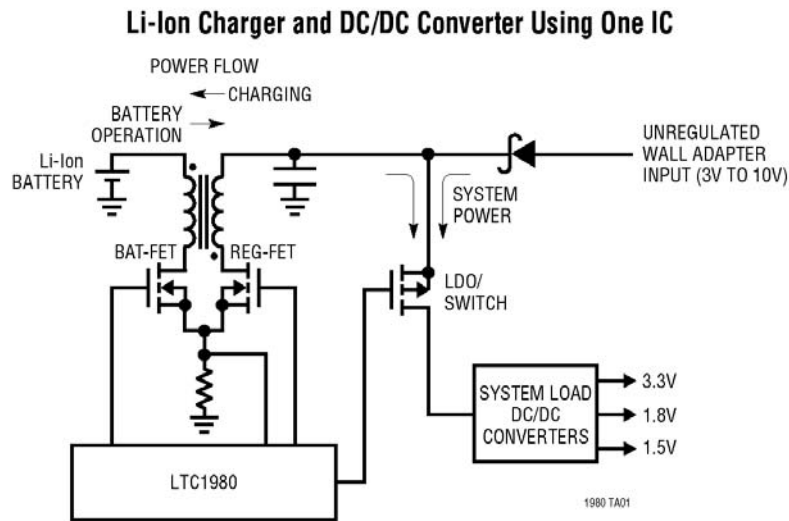


Figure 1. System Block Diagram

QUICK START PROCEDURE

Demonstration circuit DC532 is easy to set up to evaluate the performance of the LTC1980. Refer to Figure 2 for proper measurement equipment setup and follow the procedure below:

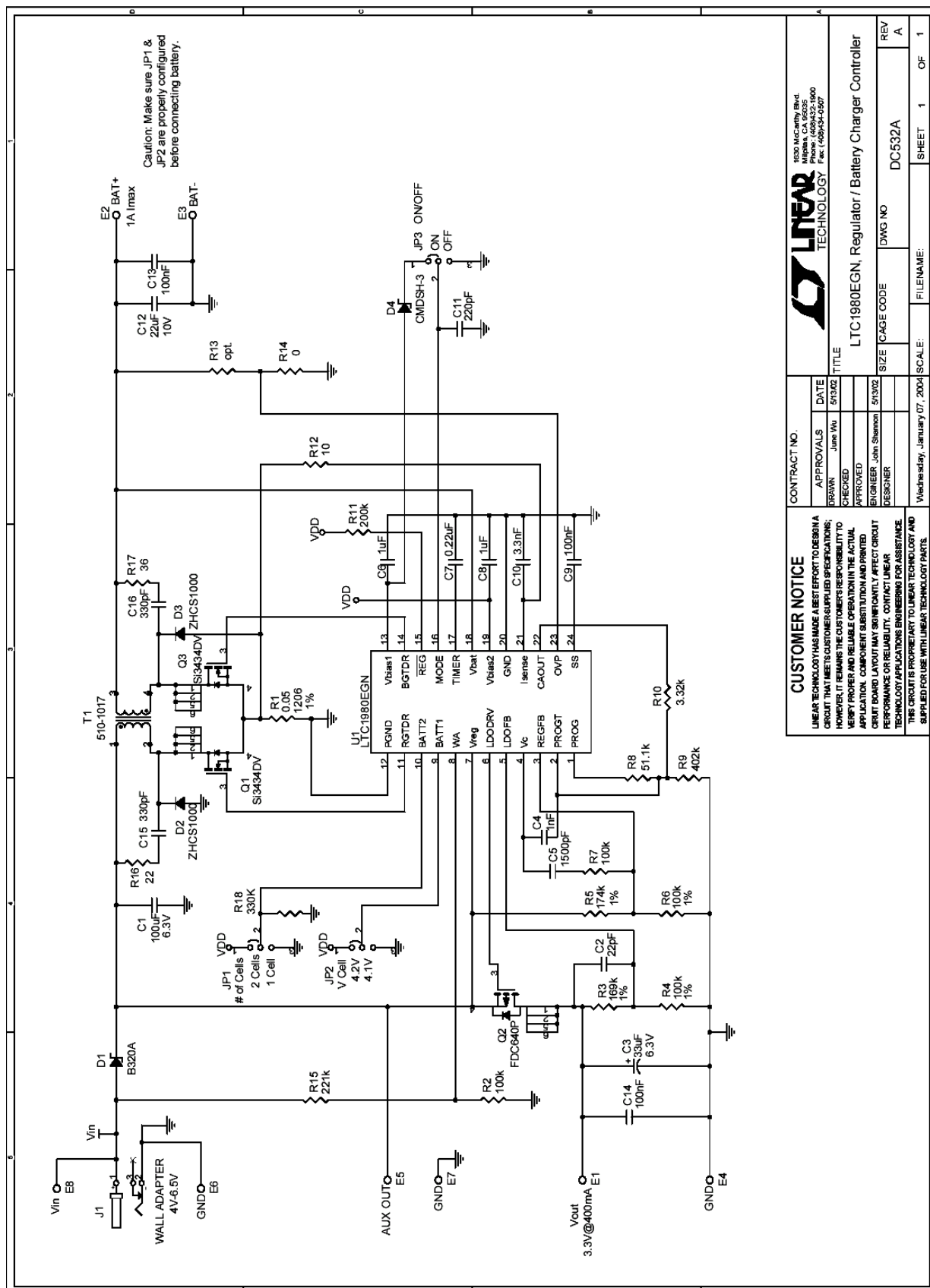
1. Connect input power supply, meters and output load as shown in figure 2.
2. Verify that the cell voltage selection jumper (JP1) and the cell number selection jumper (JP2) are in the correct position for the battery you wish to charge.
3. Set the battery simulator voltage to zero, slowly raise the input voltage. When the supply voltage exceeds 3.5V the charger should activate. At this point trickle charging of the battery should commence and the output voltage of the linear regulator should be in regulation
NOTE: Make sure that the input voltage does not exceed 6.5V.
4. Note that so long as the battery voltage is under the Trickle Charge threshold of 2.5V per cell the

charge current is 10% of the selected charge current or approximately 100mA.

5. Increase the battery voltage to about 3V per cell and note that the charge current has increased beyond the trickle charge current to the programmed charge current of 1000mA
6. Continue to increase the battery voltage, as the battery voltage approaches the jumper selected float voltage of the charge current will begin to drop.
7. Remove the input adapter power, and note that the charge current is now negative indicating that the battery is being discharged. Further note that the 3.3V output is still present.
8. Place the enable jumper in the OFF position. Note that the battery current draw is extremely low (approx 10uA) also note that the supply current draw is low (approx 20uA)

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REGULATOR / BATTERY CHARGER CONTROLLER



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CONTRACT NO.		DATE	
APPROVALS		DRAWN	June Wu
CHECKED		APPROVED	
ENGINEER	John Shannon	5/13/02	
DESIGNER			
TITLE		SIZE	CAGE CODE
LTC1980EGN, Regulator / Battery Charger Controller		DWG NO	DC-532A
REV		SCALE	FILE NAME
A		1	1
SHEET		1	OF 1

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