Li-Ion/Li-Po 18650 Battery to 5V Boost Converter

The project presented here is capable of supplying 400mA of current from a 3.7V Li-Ion/Li-Po Battery input with a 5V output. The converter has an internal soft start and internal frequency compensation features. The project is built using LTC3426 SOT23-6 chip. The LTC3426 chip is in a low profile (1mm) SOT-23 package and has a very low shutdown current of about 0.5µA. A switching frequency of 1.2MHz allows a tiny solution. The tiny PCB can be mounted on the backside of the a 18650 battery holder. Jumper J1 is the shut-down jumper. Internal soft-start eases inrush current issues.

The LTC3426 step-up switching regulator generates an output voltage of up to 5.5V from an input voltage as low as 1.6V. Ideal for applications where space is limited, it switches at 1.2MHz, allowing the use of tiny, low cost and low-profile external components. Its internal 2A, 100mΩ NMOS switch provides high efficiency even at heavy load, while the constant frequency, current mode architecture results in low, predictable output noise that is easy to filter. Anti-ringing circuitry reduces EMI concerns by damping the inductor while in discontinuous mode, and internal soft-start eases inrush current worries. Internal frequency compensation is designed to accommodate ceramic output capacitors, further reducing noise. The device features very low shutdown current of 0.5µA.

Features

- Input Supply 3.7V Li-Ion or Li-Po Battery
- Output 5V DC
- Load 400mA Maximum
- Switching Frequency 1.2Mhz
- Jumper J1 Shutdown
- Integrated Soft-Start
- PCB Dimensions 69.85 x19.05 mm



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| BOM | | | | | | |
|---|-------|-------|---------------------------------------|------------------|-------------------|-----------------------|
| NO | QNTY. | REF | DESC | MANUFACTURER | SUPPLIER | SUPPLIER PART NO |
| 1 | 1 | CN1 | 2 PIN MALE HEADER PITCH 2.54MM | WURTH | DIGIKEY | 732-5315-ND |
| 2 | 1 | CN2 | 2 PIN MALE HEADER PITCH 2.54MM | WURTH | DIGIKEY | 732-5315-ND |
| 3 | 2 | C1,C4 | 10uF/6.3V SMD SIZE 1206 | MURATA/YAGEO | DIGIKEY | |
| 4 | 2 | C2,C5 | 0.1uF/50V SMD SIZE 0805 | MURATA/YAGEO | DIGIKEY | |
| 5 | 1 | C3 | 22uF/6.3V SMD SIZE 1206 | MURATA/YAGEO | DIGIKEY | |
| 6 | 1 | D1 | SS34 OR SS14 SMD DIODE | ON SEMI | DIGIKEY | SS14CT-ND |
| 7 | 1 | J1 | JUMPER-2 PIN MALE HEADER PITCH 2.54MM | WURTH | DIGIKEY | 732-5315-ND |
| 8 | 1 | L1 | 2.2uH | MURATA | ELEMENT 14 | 2871565 |
| 9 | 1 | R1 | 1M 1% SMD SIZE 0805 | MURATA/YAGEO | DIGIKEY | |
| 10 | 1 | R2 | 91K 1% SMD SIZE 0895 | MURATA/YAGEO | DIGIKEY | |
| 11 | 1 | R3 | 4.3K 1% SMD SIZE 0805 | MURATA/YAGEO | DIGIKEY | |
| 12 | 1 | R4 | 30K 1% SMD SIZE 0805 | MURATA/YAGEO | DIGIKEY | |
| 13 | 1 | R5 | 910E 1% SMD SIZE 0805 | MURATA/YAGEO | DIGIKEY | |
| 14 | 1 | U1 | LTC3426 SMD SOT23-6 | ANALOG DEVICES | DIGIKEY | LTC3426ES6#TRPBFTR-ND |
| 15 | 1 | J1 | SHUNT FOR JUMPER J1 | SULLIN CONNECTOR | DIGIKEY | S9001-ND |
| 16 | 1 | BT | BATTERY HOLDER FOR ICR18650 | KEYSTONE | DIGIKEY | 36-1043P-ND |
| BATTERY HOLDER 18650 SUPPLIER ALIEXPRESS OR DIGIKEY | | | | | | |

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TOP LAYER

SILK SCREEN TOP

BOTTOM LAYER

PCB DIMENSIONS 69.85MM X 19.05MM





