

TP5602 charge 3A put 3A

4-in-1 monolithic system for TP5602 mobile power supply (low cost synchronous 3A lithium battery charging, 5V3A boost, display, battery protection)

Overview

TP5602 is a fully integrated, ultra-large-scale integrated circuit for mobile power applications designed for medium to large power mobile power supplies. Internally integrate automatic charge management and battery isolation PMOS2, boost management, power display, battery protection and other functions into a single chip, plus an input isolation PMOS1, a power NMOS1, an inductor, a small number of RC components, application circuit is simple, Stable and reliable performance, free debugging large production, high efficiency and high yield.

The TP5602 uses a unique single-inductance multiplexing technology with a built-in high-efficiency synchronous buck 4.2V3A lithium battery charging circuit and synchronous step-up 5V 3A output circuit; four LED display output can display the charge and discharge power in five stages, applicable to Red, green and blue LEDs are directly driven and are also used for abnormal status alarm display; no external battery protection circuit is required, and the internal integrated battery has multiple input and output protection (overvoltage, overcharge, undervoltage, overcurrent, short circuit, etc.);

TP5602 provides function settings: plug-in automatic charging, key pressurization, light-load automatic shutdown (pressurization); buck charge constant current adjustable; 5V boost output constant current external adjustable. Its QFN24 ultra-small package and simple peripheral circuits make the TP5602 ideal for high-power independent charging or independent boost management applications for other portable devices.

TP5602 has a wide input voltage (4.2-7V MAX), anti-power reverse connection, charging the battery is divided into trickle precharge, constant current, constant voltage three stages, trickle precharge current, constant current charging current are With external resistor adjustment, the maximum charge current is 3.5A. Four different LED display modes when charging different battery voltages. The switching mode of the charging switching frequency of 700KHz makes it possible to use smaller peripheral devices and maintain a small amount of heat during high-current charging.

The TP5602 has a built-in 4.25VVIO charge adaptive circuit. When the VIO current is not driven enough to cause VIO to drop to 4.2V, the internal charge current is automatically reduced. The user does not have to worry about the low-power USB port, power supply or adapter when setting the current is too large.

The TP5602 incorporates a battery-backfill PMOS2 circuit, so it is not necessary to prevent peripheral protection such as Schottky diodes.

The TP5602 synchronous boost circuit can output with a constant voltage and current limit. The voltage is internally fixed at 5V and the current can reach 3A. The current limit value can be adjusted by external setting (VIImt) to limit the output current of the battery terminal and thus control the VIO output power.

There is soft-start protection during boost start-up, output short-circuit and over-current protection (250mS over-current/short-circuit shutdown).

External NMOS, week-by-week deadline flow. Typical can drive 5V3A, limit drive 3.5A, 5V3A@Vbat=4V efficiency 93.5%.

Features

Charging the battery of the unit:

- Charging a single 4.2V lithium battery, typically 3A.
- Wide operating voltage, up to 7V.
- Bypass output, self-adaptation of power supply.
- Protection against reverse power supply, overvoltage protection against battery overvoltage 4.3V, Safer.
- Built-in power management PMOS2, fully synchronous switching mode.
- Trickle, constant current, constant voltage three-stage charging, protection of the battery.
- Programmable charge current ISET, 0.1A--3A.
- Precharge turbulence: 20%ISET constant.
- Pressure shutdown current: 20% ISET.4 LED status indicators, the highest bit flash.
- Chip over temperature automatic power down protection, under voltage protection.
- Battery end short circuit protection.
- Built-in a variety of battery protection, without external protection chip.
- Switching frequency 700KHz, typical inductance 2.2uH. 4.2V±1% charge voltage control accuracy.
- Use QFN24 4mm*4mm ultra small package.

Step-up circuit:

- Press key to start VIO, fix 5V output.
- Press key for 2.5S, boost off, enter standby mode.
- Adjustable maximum output constant current, typical output 5V3A.4-way LED status indicator, automatically after 3 seconds Turns off the light, the battery is less than 3V alarm 6 times protection, less than 2.4V full shutdown, no action.
- Chip over temperature protection, automatically reduce the output current, undervoltage, overcurrent, short circuit automatic standby protection.
- Switching frequency 300KHz.
- Light load (output < 30mA) Automatic standby after 10 seconds.
- Low battery current to 6uA after standby.
- Typical output 5V 3A, 4V Vbat typical output efficiency 93.5%. The maximum output is 5V 3.5A.

Absolute maximum rating:

- VIN: -10 to +9V.
- VBAT: -0.7V to 5V.
- Maximum junction temperature: 145° C.
- Operating temperature range: -40° C to 85° C.
- Storage temperature range: -65° C to 125° C.
- Pin temperature (welding time 10 seconds): 260° C.

Application range:

- Mobile power.
- Portable equipment.
- Electronic cigarette.

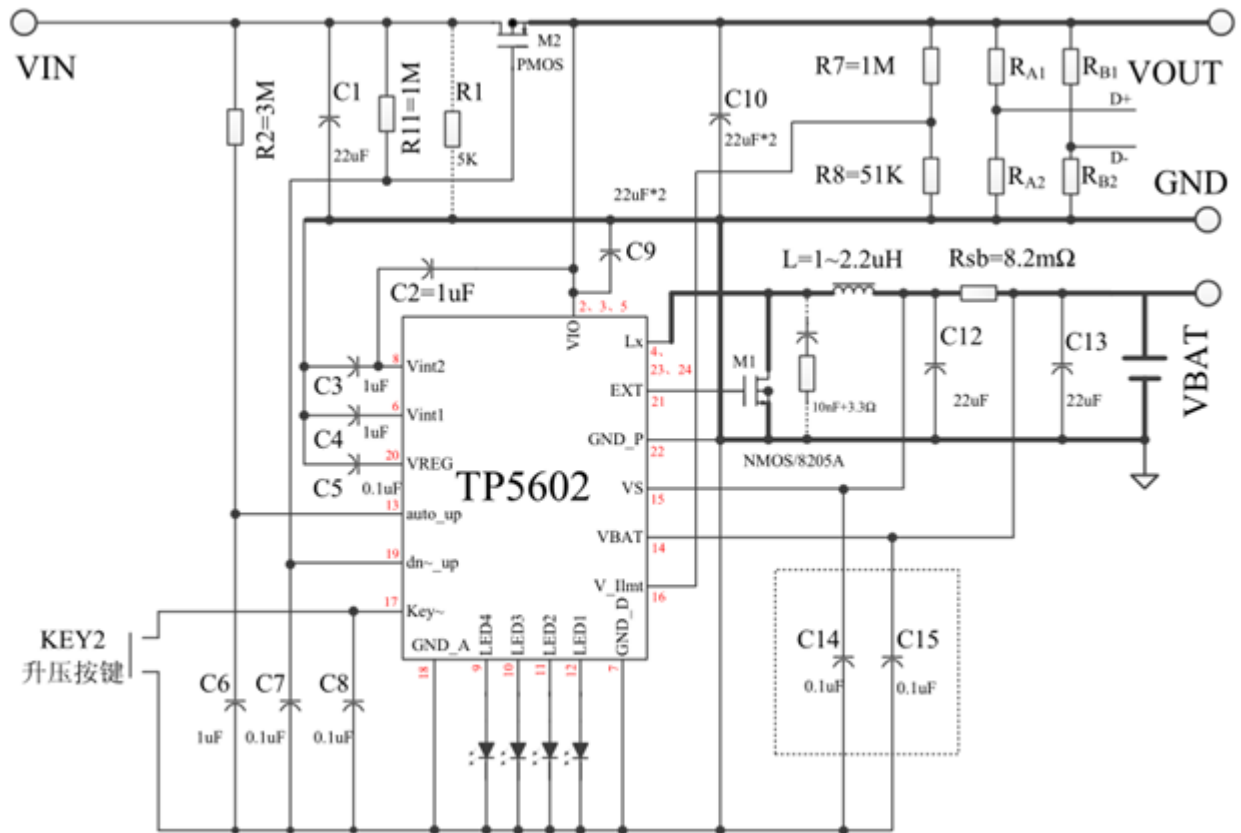


图1 TP5602 为 4.2V 锂离子电池 3A 充电、5V3A 升压应用示意图