支持QC快充的高效同步升压型2A双节/3节锂电池充电器

High Efficiency, 2-A, 2-Cell/3-Cell Synchronous Boost Battery Charger with QC Compliant

■ FEATURES

- High-efficiency 2-A, 500kHz sync-boost Charger
- Efficiency, 94% at 5V input, 8V battery, 1A charge
- VIN supports 4V~9.5V, tolerance: 28V
- Cell Balancing Available in two cell charge mode
- Adaptively apply varied voltage with QC compliant, according to the battery voltage
- 2-cell or 3-cell Li-Ion battery charger, Charge voltage is selectable: 8.1V/8.2V/8.3V/8.4V, 12.3V/12.4V/12.5V/12.6V
- Charge current up to 2A can be set through external resistor
- Adaptively input current limit to track the input power ability
- NTC available
- Charge Status indictor pin: LED
- Robustness Features
  - Input Over voltage protection, Input Undervoltage protection, Output overcurrent protection, output overvoltage protection, output shortage protection, charge overtime protection, and Overtemperature Protection
- Packages: Pb-free Packages, QFN4×4-24L

- 内置500kHz同步升压的高效2A充电
- 效率94% (V_{IN} = 5V, V_{BAT} = 8V, I_{CHG} = 1A)
- 输入电压支持4V~9.5V，容忍最高28V输入
- 双节充电时支持均衡
- 根据电池电压，支持QC快充自动申请
- 支持双节或三节串联充电，满电电压可设置：8.1V/8.2V/8.3V/8.4V, 12.3V/12.4V/12.5V/12.6V
- 充电电流可设置，最大2A
- 支持自动调节充电电流以自适应适配器负载能力
- 支持NTC保护
- LED脚支持充电状态指示
- 保护：输入过压、输入欠压、输出过流、输出过压、输出短路、充电超时、过温保护等
- QFN4×4-24L封装

■ APPLICATIONS

- Bluetooth/Wi-Fi Speakers
- Portable Speakers
- POS Printers
- Security Cameras
- 2-cell / 3-cell Battery Charging

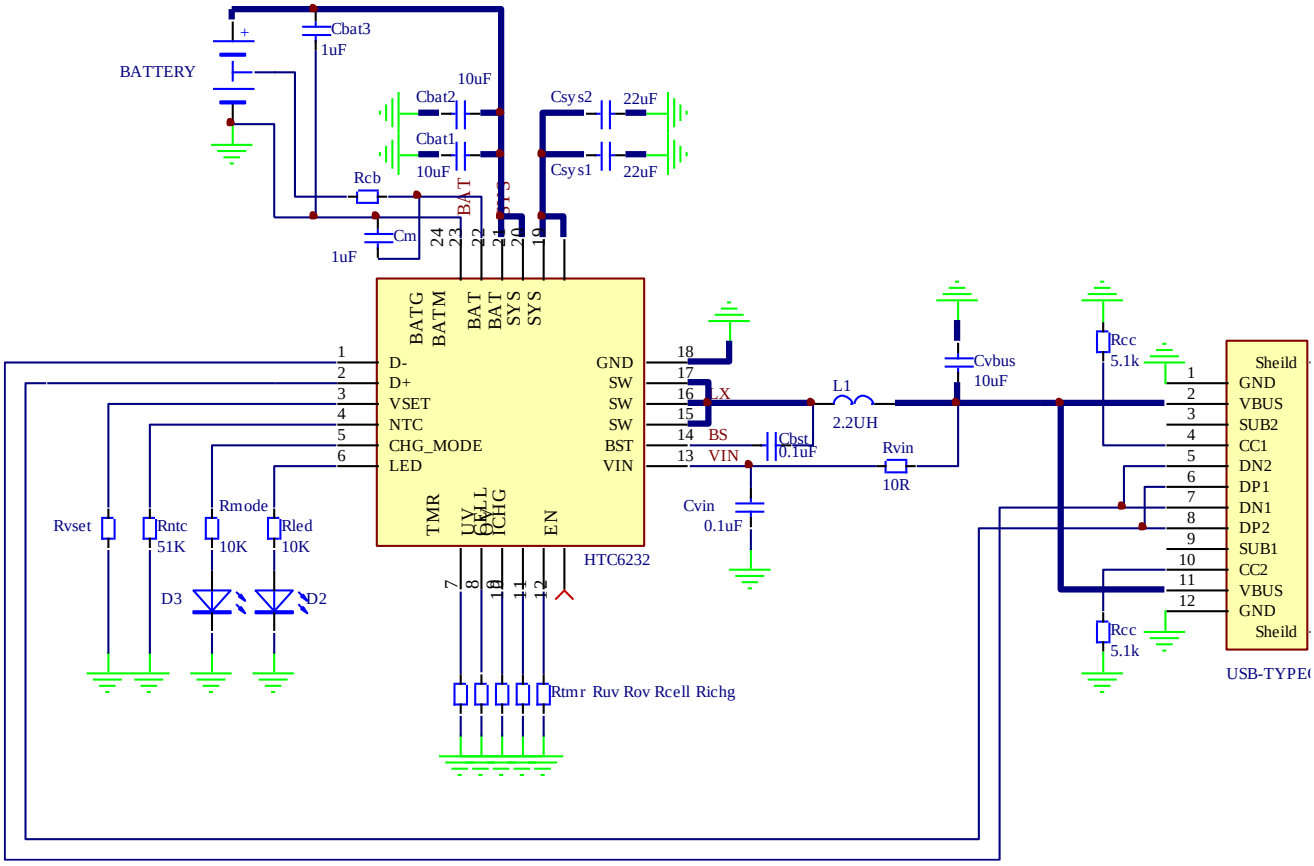
- 蓝牙/ Wi-Fi音箱
- 便携式音箱
- POS打印机
- 安全摄像机
- 2节或三节串联充电场合

■ DESCRIPTION

The HTC6232 is highly-integrated 2A sync-boost switch-mode battery charger for 2-cell or 3-cell Li-Ion and Li-polymer battery.

HTC6232是一款内置2A同步升压的高集成2A电池充电芯片，支持2节或3节串联锂电池充电。

■ TYPICAL APPLICATION



1. D+, D-连接后，可向USB端自动申请快充电压

2-CELL

VBAT	VIN快充申请电压
VBAT<6.2V	VIN = 5V
6.2V≤VBAT<6.8V	VIN = 5.4V
6.8V≤VBAT<7.8V	VIN = 6V
VBAT≥7.8V	VIN = 7V

3-CELL

VBAT	VIN快充申请电压
VBAT<9V	VIN = 5V
9V≤VBAT<10.5V	VIN = 7V
VBAT≥10.5V	VIN = 9V

2. VSET，充电满电电压微调；CELL，充电电池设置：2节或3节串联。如下表

R_{VSET}	Charge Voltage	
	CELL Floating 2-Cell	CELL = GND 3-Cell
1K	8.1V	12.3V
68K	8.2V	12.4V
120k	8.3V	12.5V
NC	8.4V	12.6V

3. NTC，设置 NTC 保护，不使用时，接 51k 电阻到地；其对外放出 20uA 电流，检测 NTC 端电压进行 NTC 保护，如下表：

V_{NTC}	Status
V_{NTC} >1.32V	Low Temperature Protection, Stop Charting
0.56V< V_{NTC} ≤1.32V	Normal
0.43V< V_{NTC} ≤0.56V	High Temperature Warning, $I_{CHG\_NTC} = I_{CHG}/2$
V_{NTC} ≤0.43V	High Temperature Protection, Stop Charging

4. CHG_MODE, LED，为充电模式指示，充电状态指示：

State	LED充电状态指示	CHG_MODE充电模式指示
亮（output high）	充电	恒流
闪烁	异常状态	-
灭（output low）	满电	涓流

5. TMR，充电计时保护设置引脚，通过设置其对地电阻 R_{TMR}，设置充电超时时间 t_{TMR}。超过该充电超时时间，芯片停止充电。

R_{TMR}	t_{TMR}
1k	Charge Timing Protection disabled
68k	4 hours
120k	12 hours
NC	24 hours

6. UV，输入欠压保护设置引脚，通过设置其对地电阻 R_{UV}，设置 VIN 端欠压保护电压阈值 V_{IN_UVLO}。当输入电压低于 V_{IN_UVLO} 时，充电电流自动减小。

R_{UV}	V_{IN_UVLO}
1k	4.25V
68k	4.35V
120k	4.45V
NC	4.65V

7. OV, 输入过压保护设置引脚，通过设置其对地电阻 R_{OV}，设置 VIN 端过压保护电压阈值 V_{IN_OV}。当输入电压高于 V_{IN_OV} 时，充电停止，LED 闪烁，BAT_MODE 维持高。

R_{OV}	V_{IN_OV}	
	CELL Floating 2-Cell	CELL = GND 3-Cell
1K	Overvoltage Protection Disabled	
68K	8V	10.3V
120k	8.4V	10.8V
NC	8.75V	11.25V

8. ICHG, 充电电流设置端，通过设置其对地电阻 R_{ICHG}，设置恒流充时的充电电流 I_{CHG}

$I_{CHG} \approx 90/R_{ICHG}$ (kohm)

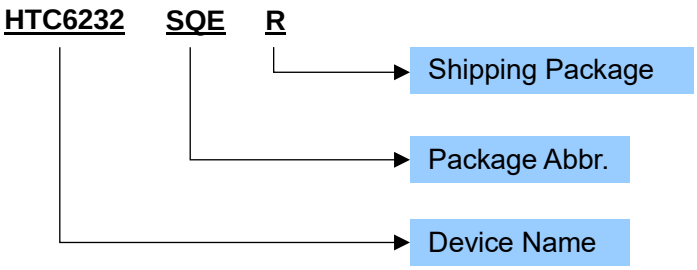
9. EN, 芯片使能端，高时芯片使能，低时芯片关闭、停止充电
10. VIN 端极限电压为 28V
11. 电感可使用典型 2.2uH，饱和电流 I_{SAT} 建议大于$1.4 \times \frac{8.4 \times I_{CHG}}{4.5 \times 0.9}\ (2cell)\ or\ 1.4 \times \frac{12.6 \times I_{CHG}}{4.5 \times 0.9}\ (3cell)$
12. SYS 端，靠近引脚建议放置至少两个 22uF 电容；BAT 端，靠近引脚建议放置至少 2 个 10uF 电容，并关注电容额定电压（建议>=20V）
13. 电池均衡功能仅在 2 节串联时有效。不使用电池均衡时，BATM, BATG 可悬空。当其中一节电池电压 VBAT1>4.1V 而另一节电池电压 VBAT2<4.1V, 均衡功能开启；当两节电池电压均>4.1V，则均衡功能关闭。在非正常充电状态下（如 NTC 保护、输入过压、电池满电等），均衡功能亦关闭。

    均衡电流 $I_{CB} = 4.1V/R_{CB}$, I_{CB} 建议<40mA, 关注 R_{CB} 封装，建议使用 0805 或更大尺寸。

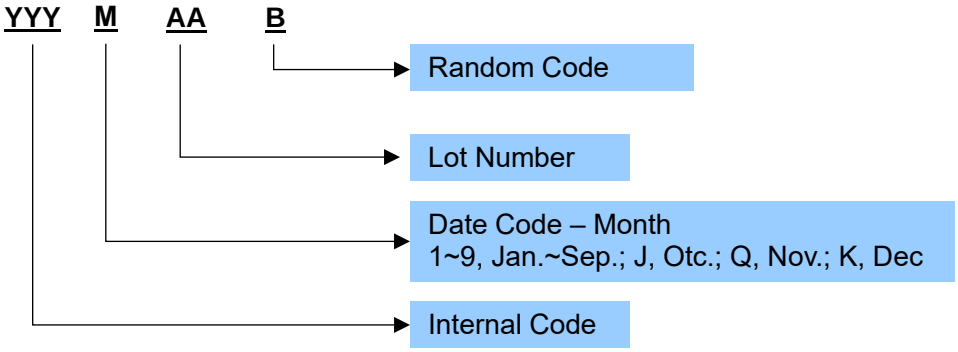
■ ORDERING INFORMATION

Part Number	Package Type	Package Abbr.	Eco Plan	MSL Level	Marking	Shipping Package / MOQ
HTC6232SQER	QFN4×4-24L	SQE	RoHS	MSL3	HTC6232 YYYMAAB[1]	Tape and Reel (R) / TBD

Part Number



Production Tracking Code



[1] YYYMAAB is production tracking code

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