

20V, 20A全集成同步升压转换器

20V, 20A Fully-Integrated Synchronous Boost Converter

■ FEATURES

- Input voltage range V_{IN} : 2.7V to 20V
- Output voltage range V_{OUT} : 4.5V to 20V
- Programmable switch peak current limit: up to 20A
- High Efficiency
96% ($V_{IN} = 7.4V$, $V_{OUT} = 15V$, $I_{OUT} = 2A$)
- 1.0 μ A current consumption during shutdown
- Programmable soft start
- Output overvoltage protection (at 22V), cycle-by-cycle overcurrent protection, thermal shutdown protection
- Pb-free Packages, QFN3 $\times$ 3-16L
- 输入电压范围 V_{IN} : 2.7V-20V
- 输出电压范围 V_{OUT} : 4.5V-20V
- 可编程峰值电流: 20A
- 高转换效率:
96% ($V_{IN} = 7.4V$, $V_{OUT} = 15V$, $I_{OUT} = 2A$)
- 低关断功耗, 关断电流1 μ A
- 可编程软启动
- 输出过压 (22V)、逐周期过流、热关断等保护
- QFN3 $\times$ 3-16L, 无铅超薄封装

■ APPLICATIONS

- Wireless/ Speakers
- Portable Speakers
- Quick Charge Power Bank
- E-Cigarette
- Power Interface (USB Type-C, Thunderbolt)
- POS Terminal
- Tablet PC/Note Book
- 无线音箱
- 快充移动电源
- USB TYPE-C 电源传输
- 平板电脑, 笔记本电脑
- 便携式音箱
- 电子烟
- 拉杆音箱
- POS机终端

■ DESCRIPTION

The HTN872A is a high-power density, fully integrated synchronous boost converter with an 8m Ω power switch and an 10m Ω rectifier switch to provide a high efficiency and small size solution in portable systems. The HTN872A has wide input voltage range from 2.7 V to 20V to support applications with single cell and two cell Lithium batteries. The device has 20A switch current capability and can provide an output voltage up to 20V.

The HTN872A uses adaptive constant off-time peak current control topology to regulate the output voltage. In moderate to heavy load condition, it works in the PWM mode. In light load condition, the device works in PFM mode to improve the efficiency. The switching frequency in the PWM mode is internally fixed at around 370kHz.

The HTN872A also implements a programmable soft-start function and an adjustable switching peak current limit function. In addition, the device provides 22V output overvoltage protection, cycle-by-cycle overcurrent protection, and thermal shutdown protection.

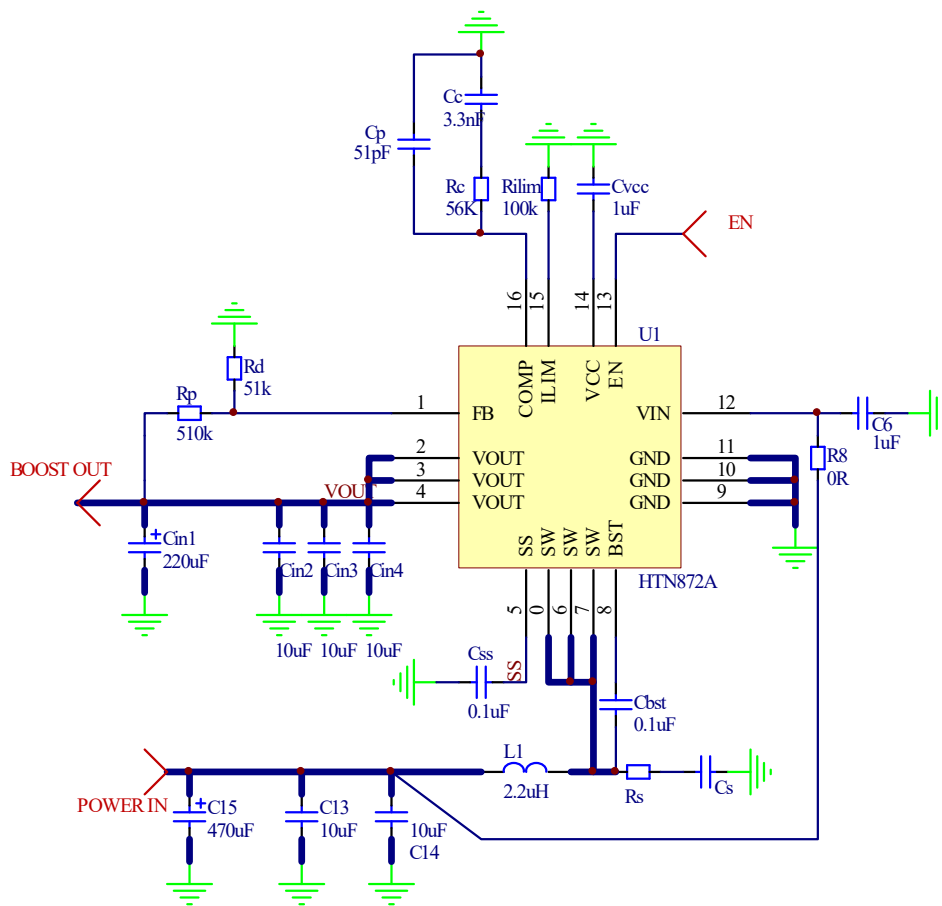
HTN872A是一款高功率、全集成升压转换器, 集成8m Ω 功率开关管和10m Ω 同步整流管, 为便携式系统提供高效的小尺寸解决方案。

HTN872A具有2.7V至20V宽输入电压范围, 可为采用单节或两节锂电池的应用提供支持。该器件具备20A开关电流能力, 并且能够提供20V的输出电压。

HTN872A采用自适应恒定关断时间峰值电流控制拓扑结构来调节输出电压。在中等到重负载条件下, HTN872A工作在PWM 模式。在轻负载条件下, 该器件工作在PFM模式, 以提高效率。PWM模式下, HTN872A的开关频率内部固定在约370kHz。

HTN872A还支持可编程的软启动, 以及可调节的开关峰值电流限制。

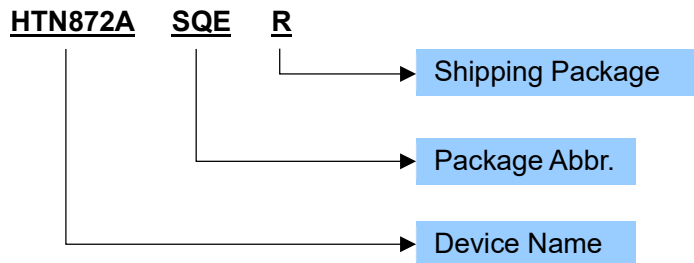
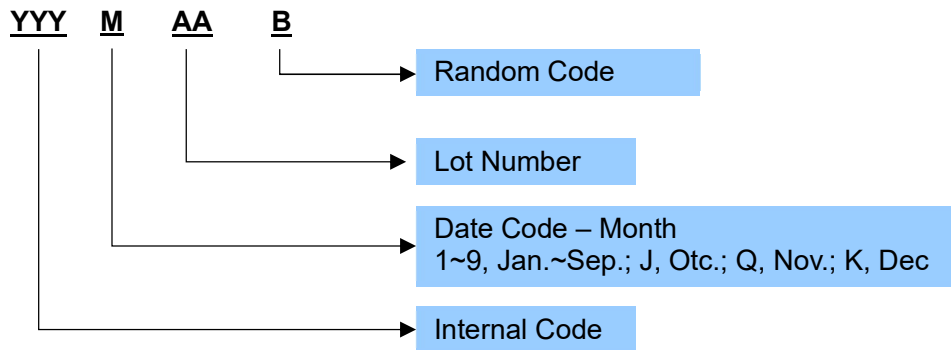
此外, 该器件还提供有22V输出过压保护、逐周期过流保护和热关断保护。

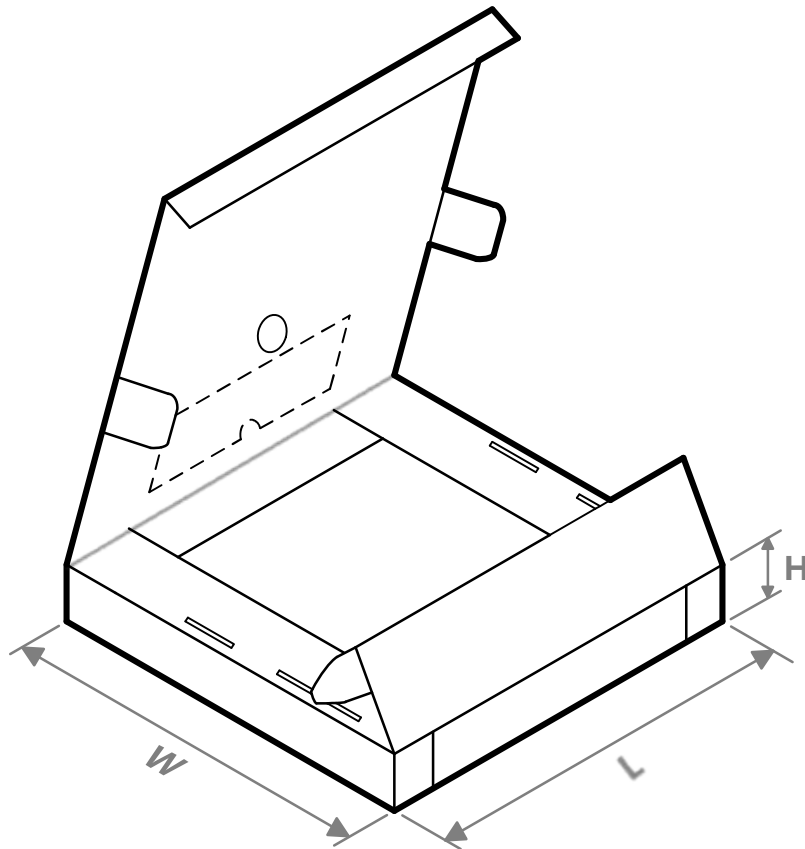
■ TYPICAL APPLICATION


1. 升压值设置: $V_{OUT} = 1.204 \times (1 + \frac{R_P}{R_N})$
2. 升压输出电压端, VOUT电容, 建议放置0.1uF//1uF//220uF的并联电容到地;
3. SS电容, 设置软起动时间, 典型100nF。 $t_{SS}(ms) \approx \frac{1.204 \times C_{SS}(nF)}{5}$
4. 升压输入端, VIN电容, 至少加入10uF电容到地;
5. 升压部分电感推荐使用2.2uH, 其饱和电流 $I_{SAT} > I_{LIM}$
6. SW端RC典型值: $R_s = 1\Omega$, $C_s = 3.3nF$
7. EN内部下地1300k电阻。EN拉高, 芯片工作; EN拉低, 芯片停止工作。
8. ILIM升压部分电感峰值电流 I_{LIM} 设置, 通过ILIM pin下地电阻 R_{ILIM} , ILIM设置建议小于电源输入端最大电流能力, 并设置大于 $1.4 \times \frac{P_{o_peak}}{V_{IN} \times 70\%}$ 。 $I_{LIM} = \frac{1500}{R_{ILIM}(k\Omega)}$
9. Comp端设置升压部分的补偿电路, 一般使用推荐的 $R_c = 27k$, $C_c = 3.3nF$, $C_p = 51F$ 。如出现输出不稳定等环路不稳定导致的异常, 可调整Comp参数, 具体参考使用我司excel计算工具。

ORDERING INFORMATION

Part Number	Package Type	Package Abbr.	Marking	Shipping Package / MOQ
HTN872ASQER	QFN3×3-16L	SQE	HTN872A YYYMAAB ¹	Tape and Reel / 5000

Part Number

Production Tracking Code


■ TAPE AND REEL BOX INFORMATION


器件料号 Part No.	封装类型 Package Type	封装标识 Package Code	引脚数 Pins	SPQ	长度 Length (mm)	宽度 Width (mm)	高度 Height (mm)
HTN872ASQER	QFN3×3	SQE	16	5000	360	340	53

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