

内置自适应升压/AGC/限温功能 7W单声道智能音频功率放大器

■ 特点

- 具有电池跟踪和限幅功能的自动增益控制 (AGC)
 - 电池跟踪 (Battery Tracking) 功能: 电池电压较低时, 自动减小系统增益, 延长电池续航时间
 - 限幅 (Limiter) 功能: 自由选择音频限制幅度, 使输出音频信号限制在固定失真水平内
- 内置自适应升压
 - 小音乐信号时不升压, 可大幅提高系统效率, 延长电池续航时间
- 内置自动限温控制功能
 - 特别适用于升压7.85V+D类, 升压+AB类状态下及环境温度较高的情况, 显著提升音乐峰值功率
- 静态电流: 4.0mA, 3.6V
- 效率: 88% ($V_{BAT} = 4.2V, R_L = 4\Omega + 22\mu H, P_o = 0.6W$)
- THD+N: 0.02% ($V_{BAT} = 3.6V, R_L = 4\Omega + 22\mu H, P_o = 0.5W, \text{Class D}$)
- 灵活配置: 可选择硬件或I²C控制模式
- 电源
 - 升压输入 V_{BAT} : 2.8V至5.0V
 - 升压输出 V_{POUT} 多种选择: 5.45V, 6.45V, 7.45V, 7.85V
- 输出功率
 - 3.4 W ($V_{BAT}=4.2V, V_{POUT} = 5.45V, R_L=4\Omega, \text{THD+N}=1\%$)
 - 4.7 W ($V_{BAT}=4.2V, V_{POUT} = 6.45V, R_L=4\Omega, \text{THD+N}=1\%$)
 - 6.2 W ($V_{BAT}=4.2V, V_{POUT} = 7.45V, R_L=4\Omega, \text{THD+N}=1\%$)
 - 7.0 W ($V_{BAT}=4.2V, V_{POUT} = 7.85V, R_L=4\Omega, \text{THD+N}=1\%$)
- 二种增益选择: 25dB, 30dB; I²C控制模式下最大支持80阶音量调节
- 多种模式可选: 升压+D类, 升压+AB类, 单独D类, 单独AB类
- 保护功能: 过流/过热/欠压异常保护功能
- 无铅无卤封装, TSSOP20L-PP

■ 应用

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| <ul style="list-style-type: none"> · 蓝牙音箱/Wi-Fi音箱 · iphone/ipod/ipod docking · 小尺寸LCD电视/监视器 | <ul style="list-style-type: none"> · 便携式音箱 · MP4, 导航仪 · 便携式游戏机 | <ul style="list-style-type: none"> · 2.1声道小音箱 · 平板电脑, 笔记本电脑 | <ul style="list-style-type: none"> · 拉杆音箱 · 智能手机 |
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■ 概述

HT862是一款内置自适应升压/AGC/限温功能的单声道智能音频功率放大器。由锂电池供电升压至7.85V时, 4 Ω 负载条件下, 能连续输出7W功率(1% THD+N)。

HT862内置的自适应升压可提供5.45V, 6.45V, 7.45V, 7.85V四种输出电压选择, 以满足不同的输出功率需求。另外, 该升压还具有自适应功能, 小音乐信号时不升压, 可大幅提高系统效率, 延长电池续航时间。

HT862内置了丰富的自动增益控制 (AGC) 功能, 包括限幅 (Limiter) 和电池跟踪 (Battery Tracking) 功能。限幅功能开启后, 即使输入信号很大, 音乐输出也能被限制在指定的功率和THD+N之内; 电池跟踪功能开启后, 当电池电压低于设定值, HT862能随电池电压降低而逐步减小增益以限制电池电流, 此举能大幅延长电池续航时间, 并且能防止破音和过大的电流需求, 降低电池在低电量时提前进入锁死状态的风险。

HT862还具有自动限温控制 (TFB) 功能, 在高功率输出、高环境温度等情况下导致芯片片内温度较高时, 芯片能自动降低系统增益, 避免芯片进入过温关断保护模式, 在保证音乐品质的前提下显著提升音乐峰值功率。

HT862可在多种模式下自由切换, 以满足更多的系统应用需求: 升压+D类, 升压+AB类, 单独D类, 单独AB类。

HT862支持硬件控制模式和I²C控制模式。在I²C控制模式下, 提供了丰富的功能和参数配置。

此外, HT862内部集成免滤波器调制技术, 能够直接驱动扬声器, 内置的关断功能使待机电流最小化, 还集成了输出端过流保护、片内过温保护和电源欠压异常保护等功能。

芯片料号	升压方式	可选升压值
HT862B3	同步升压	5.45V, 6.45V, 7.45V
HT862T3	非同步升压	5.45V, 6.45V, 7.45V, 7.85V

7W Smart Audio Amplifier with Boost Converter, TFB and AGC

■ FEATURES

- Automatic Gain Control (AGC) with Battery Tracking and Limiter function
 - Battery Tracking: automatically reduce system gain to extend battery life when the battery voltage is low
 - Limiter: adjusts the amplifier gain to prevent heavy clipping
- Integrated Adaptive Boost Converter
 - Increases efficiency at low output power
- Integrated Thermal Foldback (TFB) function
 - Particularly apply to applications of 7.85V+Class D, Boost + Class AB or one with a weak thermal system, significantly increase the peak audio power
- Low quiescent current of 4.0mA ($V_{BAT} = 3.6V$)
- Efficiency: 88% ($V_{BAT} = 4.2V, R_L = 4\Omega + 22\mu H, P_o = 0.6W$)
- THD+N: 0.02% ($V_{BAT} = 3.6V, R_L = 4\Omega + 22\mu H, P_o = 0.5W, \text{Class D}$)
- Control Mode :Hardware or I²C
- Power Supply/Output
 - V_{BAT} from 2.8V to 5.0V
 - Multiple Boost Output V_{POUT} Settings: 5.45V, 6.45V, 7.45V, 7.85V
- Output Power
 - 3.4 W ($V_{BAT}=4.2V, V_{POUT} = 5.45V, R_L=4\Omega, \text{THD+N}=1\%$)
 - 4.7 W ($V_{BAT}=4.2V, V_{POUT} = 6.45V, R_L=4\Omega, \text{THD+N}=1\%$)
 - 6.2 W ($V_{BAT}=4.2V, V_{POUT} = 7.45V, R_L=4\Omega, \text{THD+N}=1\%$)
 - 7.0 W ($V_{BAT}=4.2V, V_{POUT} = 7.85V, R_L=4\Omega, \text{THD+N}=1\%$)
- Two gain settings in hardware mode: 25dB, 30dB; 80-step volume control In I²C Mode
- Optional multiple modes : Boost + Class D, Boost + Class AB, Class D only and Class AB only
- Over Current /Thermal/Low voltage malfunction prevention function with auto recovery
- Pb-free Packages, TSSOP20L-PP

■ APPLICATIONS

- Bluetooth/Wi-Fi Speakers
- Portable Speakers
- 2.1Channel Speakers
- Megaphone
- Portable Gamers
- MP4, GPS
- LCD TV/Monitor
- Tablet PC/Note Book

■ DESCRIPTION

The HT862 is a smart audio power amplifier with TFB, AGC technology and an integrated adaptive boost converter that enhances efficiency at low output power. It drives up to continuous 7W (1% THD+N, boosted to 7.85V) into 4ohm speaker from a Li-battery voltage.

The built-in boost converter generates a supply voltage (5.45V, 6.45V, 7.45V, 7.85V optional to meet different out power demands) for the audio amplifier. The boost converter is adaptive and is automatically active only when the peak output audio signal exceeds a preset voltage threshold, which is optimized to prevent clipping while maximizing system efficiency.

HT862 integrates Automatic Gain Control (AGC), including Limiter and Battery Tracking function. When Limiter function is active, the output music can be limited below the preset power and THD+N. When Battery Tracking function is active, HT862 monitors the battery voltage and the audio signal, automatically decreasing gain when battery is lower than preset voltage and the audio output power is high. It finds the optimal gain to maximize the loudness and minimize the battery current, providing louder audio and preventing early shutdown at end-of-charge battery voltages.

The HT862 Thermal Foldback (TFB) is designed to protect the HT862 from excessive die temperature in case of the device being operated beyond the recommended temperature or power limit, or with a weaker thermal system than recommended. The TFB works by reducing the on-die power dissipation by reducing Gain if the temperature trig point is exceeded, so that the peak audio power is significantly increased.

HT862 can be switched in various modes to adapt different system, such as boost + Class D, boost + Class AB, Class D only and Class AB only.

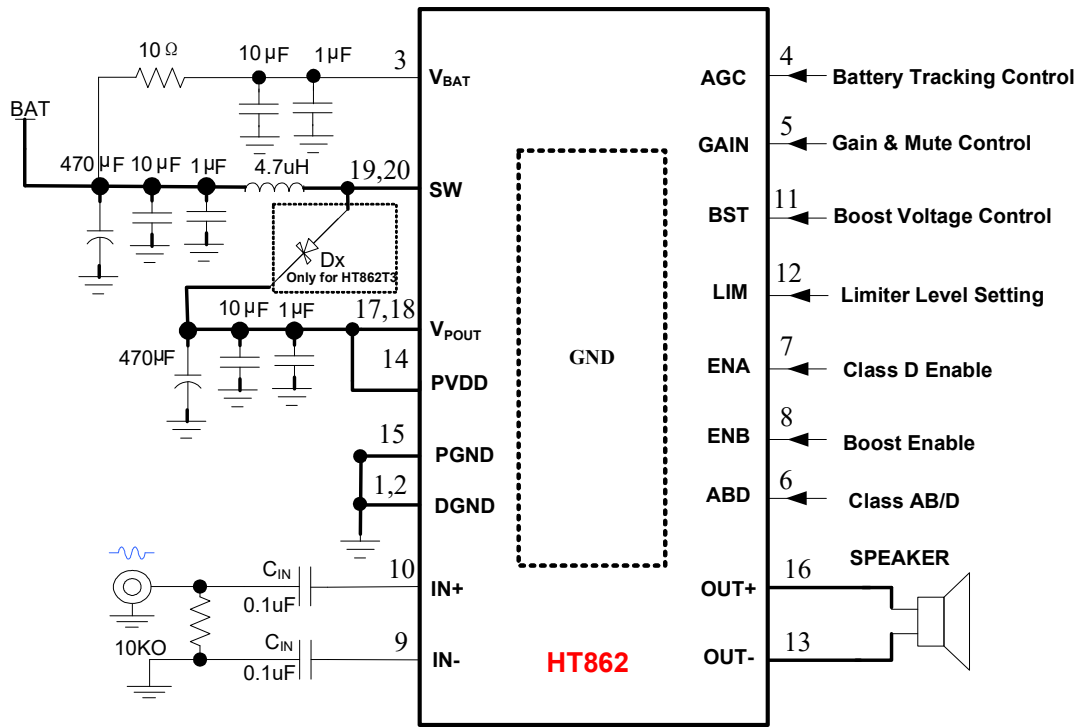
Both hardware and I²C control mode are available for HT862. More functions and parameters can be configured in I²C control mode.

HT862 has a filter-less modulation circuit which can directly drive speakers. HT862 can be shut down so that the power consumption can be minimized. As for protection function, over current protection function for speaker output terminals, over temperature protection function and low supply voltage malfunction preventing function are also prepared.

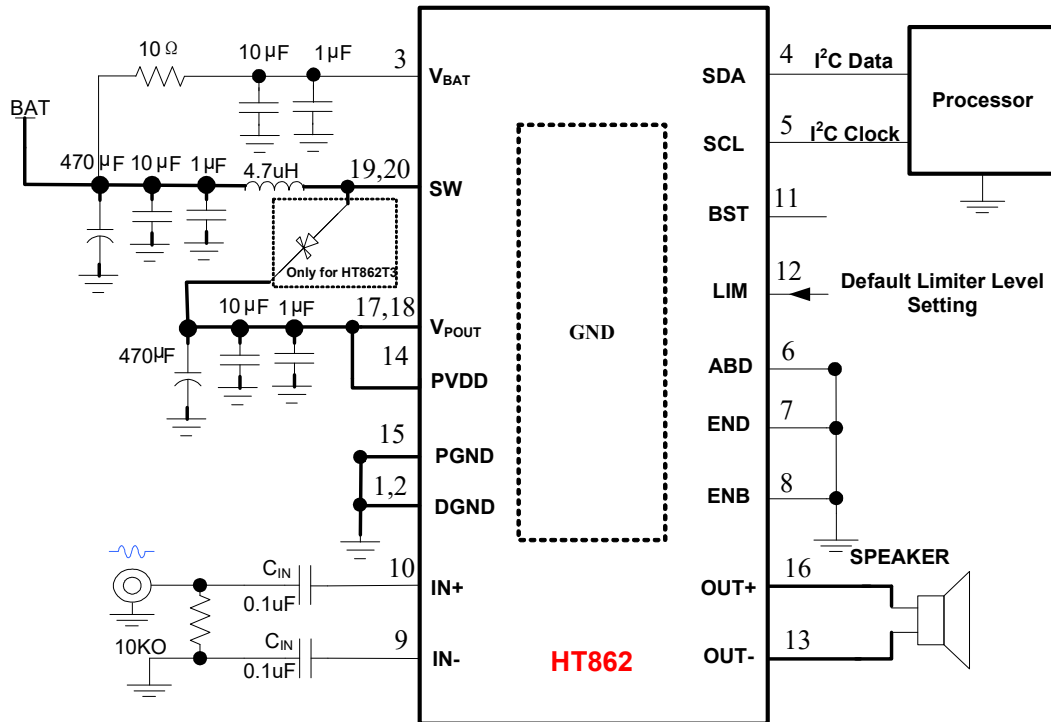
Part No.	Boost Converter	Available Boost Voltage
HT862B3	Sync	5.45V, 6.45V, 7.45V
HT862T3	Non-Sync	5.45V, 6.45V, 7.45V, 7.85V

■ TYPICAL APPLICATION

1. HARDWARE CONTRL MODE



2. I²C CONTROL MODE



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