

# 内置高效率自适应电荷泵升压，防削顶失真功能，D/AB切换的5.2W单声道音频功率放大器

## ■ 特点

- 4种防削顶失真功能(Anti-Clipping Function, ACF)
- 自适应电荷泵升压功能
- 内部固定28dB增益
- 输出功率
  - 5.2W ( $V_{BAT}=4.2V, R_L=4\Omega, THD+N=10\%$ )
  - 4.0W ( $V_{BAT}=3.7V, R_L=4\Omega, THD+N=10\%$ )
  - 3.0W ( $V_{BAT}=3.3V, R_L=4\Omega, THD+N=10\%$ )
- 效率
  - 84% ( $V_{BAT}=3.7V, R_L=4\Omega, 0.4W$ )
  - 75% ( $V_{BAT}=3.7V, R_L=4\Omega, 2W$ )
- 电源
  - 升压输入 $V_{BAT}$ : 2.7V至5.5V
  - 升压输出 $CPOUT$ : 6.4V
- 静态工作电流: 3mA
- 关断电流: <1uA
- AB/D类可切换
- 免滤波器数字调制，直接驱动扬声器
- 保护功能: 过流/过热/欠压异常保护功能
- 无铅封装， QFN3×3-16L

## ■ 应用

- 智能音响
- 无线音响
- 便携式音频设备
- 智能手机

## ■ 概述

HT8310 是一款 D 类音频功率放大器，在  $V_{BAT}=4.2V$ 、 $THD+N=10\%$ ， $4\Omega$  负载条件下能连续输出 5.2W 功率。该 D 类功放的电源电压由内置的自适应电荷泵升压模块提供。该升压模块在低功率时不升压，可有效提升电池的播放时间。

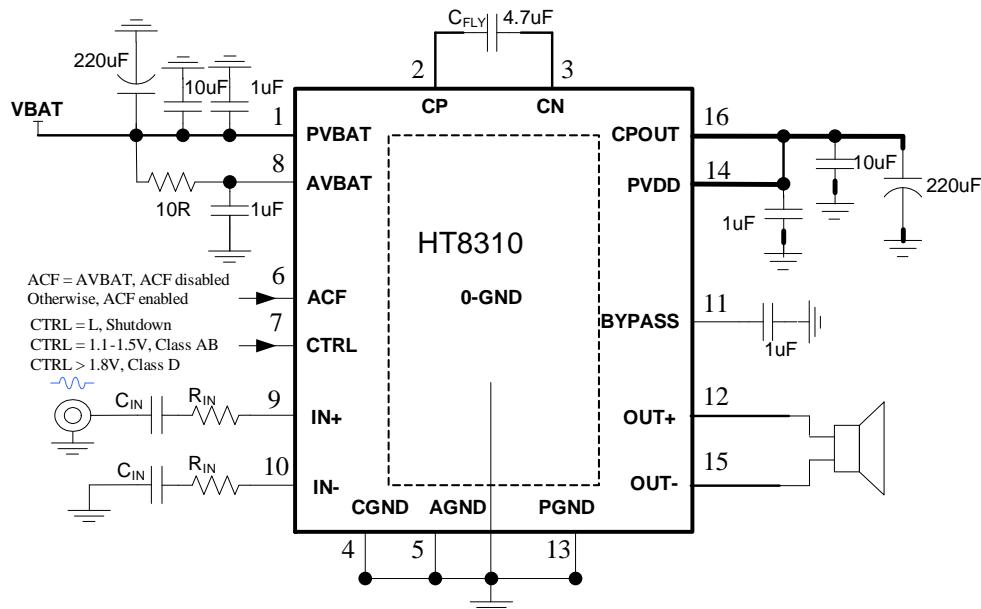
HT8310 的最大特点是防削顶失真 (ACF) 输出控制功能，可检测并抑制由于输入音乐、语音信号幅度过大所引起的输出信号削顶失真 (破音)，也能自适应地防止在升压电压下降所造成的输出削顶，显著提高音质，创造非常舒适的听音享受，并保护扬声器免受过载损坏。其具有 4 种不同的 ACF 模式，可针对不同应用场合。同时芯片还具有 ACF-Off 模式。

HT8310 具有 AB 类和 D 类的自由切换功能，在受到 D 类功放 EMI 干扰困扰时，可随时切换至 AB 类音频功放模式 (此时电荷泵升压功能关闭)。

HT8310 内部集成免滤波器数字调制技术，能够直接驱动扬声器，并最大程度减小脉冲输出信号的失真和噪音。输出无需滤波网络，极少的外部元器件节省了系统空间和成本，是便携式应用的理想选择。

此外，HT8310 内部固定 28dB 增益，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。

## ■ 典型应用图



## 5.2W Anti-Clipping Mono Class D/AB Audio Amplifier with Adaptive Charge Pump Regulator

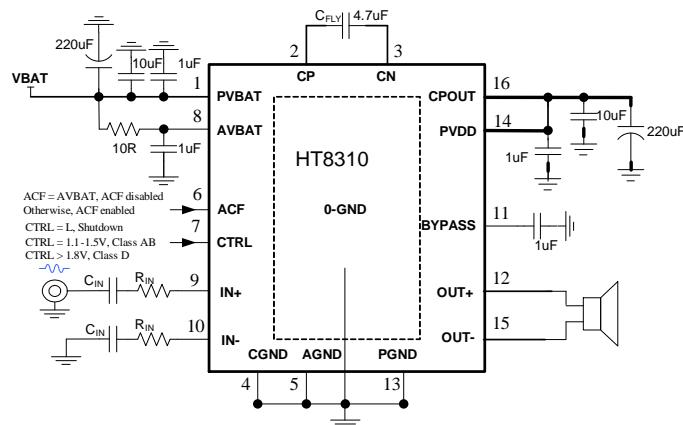
### ■ FEATURE

- 4 modes of Anti-Clipping Function (ACF)
- Adaptive Charge Pump Regulator
- Maximum Voltage Gain: 28dB
- Output Power
  - 5.2W ( $V_{BAT}=4.2V$ ,  $R_L=4\Omega$ , THD+N=10%)
  - 4.0W ( $V_{BAT}=3.7V$ ,  $R_L=4\Omega$ , THD+N=10%)
  - 3.0W ( $V_{BAT}=3.3V$ ,  $R_L=4\Omega$ , THD+N=10%)
- Efficiency
  - 84% ( $V_{BAT}=3.7V$ ,  $R_L = 4 \Omega$ ,  $P_o = 0.4W$ )
  - 75% ( $V_{BAT}=3.7V$ ,  $R_L = 4 \Omega$ ,  $P_o = 2.0W$ )
- Power Supply
  - Input  $V_{BAT}$ : 2.7V to 5.5V
  - Output CPOUT: 6.4V
- Quiescent Current: 3mA
- Shutdown Current: <1uA
- Class AB / Class D selectable
- Filter-less Modulation, Eliminating Output Filter
- Over Current Protection, Thermal Protection, Low voltage malfunction prevention function included
- Pb-Free Packages , QFN3x3-16L

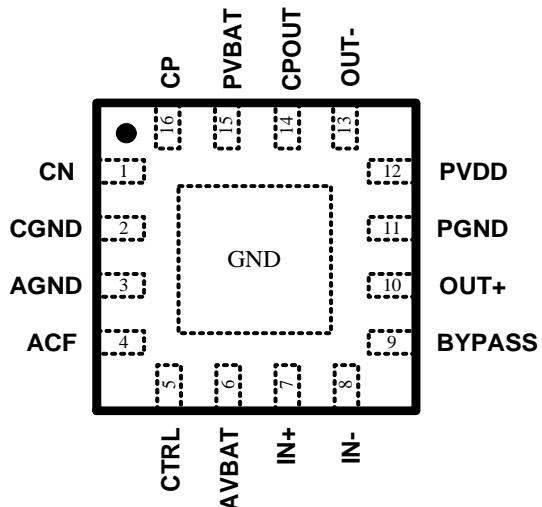
### ■ APPLICATIONS

- Smart Speakers
- Wireless Speakers
- Portable Audio Devices
- Smart Phones

### ■ TYPICAL APPLICATION



## ■ TERMINAL CONFIGURATION



Top View

## ■ TERMINAL FUNCTION <sup>1</sup>

Terminal No.	Name	I/O	ESD Protection	Description
/	GND	GND	--	Ground
15	PVBAT	POWER	PN	Power supply for the charge pump regulator
16	CP	I	PN	Flying capacitor positive terminal
1	CN	I	PN	Flying capacitor negative terminal
2	CGND	GND	--	Ground for the charge pump regulator
3	AGND	GND	--	Analog ground
4	ACF	I	PN	ACF selection terminal. ACF is disabled when it is pulled to VBAT directly.
5	CTRL	I	PN	Mode selection terminal. When it is pulled low, the device goes into shutdown mode.
6	AVBAT	POWER	PN	Analog power supply
7	IN+	I	PN	Positive audio input terminal
8	IN-	I	PN	Negative audio input terminal
9	BYPASS	O	PN	Analog reference terminal, connecting a 1uF capacitor to ground
10	OUT+	O	PN	Positive BTL audio output
11	PGND	GND	--	Power ground for audio amplifier
12	PVDD	POWER	PN	Power supply for audio amplifier
13	OUT-	O	PN	Negative BTL audio output
14	CPOUT	POWER	PN	Boosted voltage output of the charge pump regulator

## ■ ORDERING INFORMATION

Part Number	Package Type	Marking	Operating Temperature Range	Container/MOQ
HT8310SQER	QFN3x3-16L	HT8310 <sup>SQ</sup>	-40°C~85°C	Tape and Reel/5000PCS

<sup>1</sup> I: Input; O: Output

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