

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

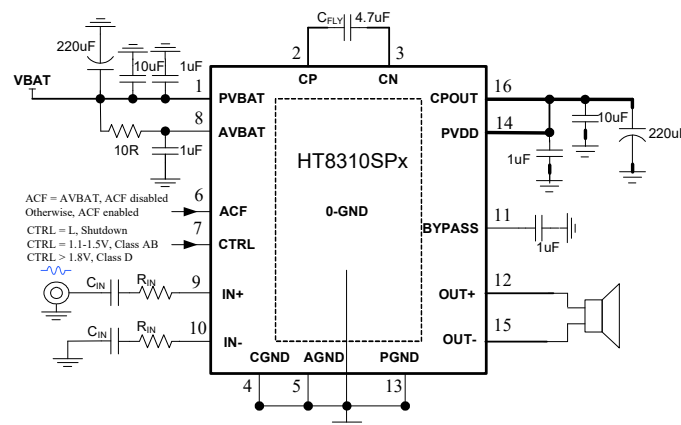
## FEATURE

- 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  $C_{POUT}$ : 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 , SOP16L-PP, QFN16L-PP

## APPLICATIONS

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

## TYPICAL APPLICATION



## GENERAL DESCRIPTION

HT8310 is a Class D audio amplifier which can deliver continuous 5.2W output power into a 4Ω speaker with 4.2V battery supply when THD+N = 10%. The class D audio amplifier's power supply is adaptively boosted by the integrated charge pump regulator which only works while the output power is big enough. This will significantly extend the playing time in battery supply applications.

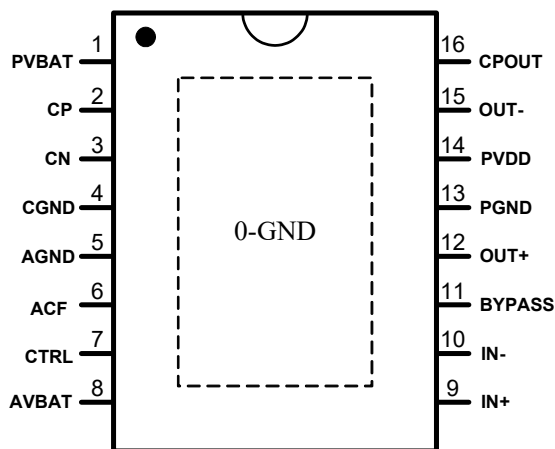
HT8310 features Anti-Clipping Function (ACF) which detects output signal clip due to the over input signal and suppresses the output signal clip automatically. Also, it can adapt the output clip caused by power supply voltage down. It can significantly improve the sound quality, creating a very comfortable musical enjoyment, and to protect the speakers from overload damage. It provides 4 different ACF modes and ACF OFF mode to adjust different applications.

Class AB amplifier mode is also available for HT8310. Once the EMI Interference from class D and Boost Converter becomes an annoying problem, HT8310 can be changed into Class AB mode.

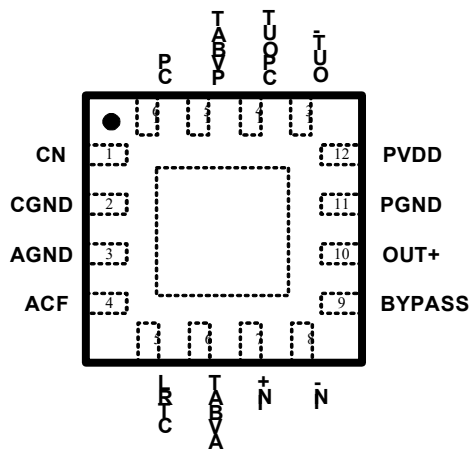
HT8310 has a filter-less modulation circuit which directly drives speakers while realizes low distortion and low noise characteristics. Thanks to filter-less, circuit design with fewer external parts can be made in portable applications.

HT8310 has an internal gain of 28dB and an independent Shutdown function which can minimize the power consumption. 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.

## ■ TERMINAL CONFIGURATION



HT8310SPx (SOP16L-PP) Top View



HT8310SQx(QFN16L-PP) Top View

## ■ TERMINAL FUNCTION <sup>1</sup>

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

## ■ ORDERING INFORMATION

Part Number	Package Type	Marking	Operating Temperature Range	Container/MOQ
HT8310SPT	SOP16L-PP	HT8310 <sup>SP</sup>	-40°C ~ 85°C	Tube/50PCS
HT8310SPR	SOP16L-PP	HT8310 <sup>SP</sup>	-40°C ~ 85°C	Tape and Reel/2500PCS
HT8310SQR	QFN16L-PP	HT8310 <sup>SQ</sup>	-40°C ~ 85°C	Tape and Reel/5000PCS

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

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