

内置BOOST升压的2×5.5W立体声音频功率放大器

■ 特点

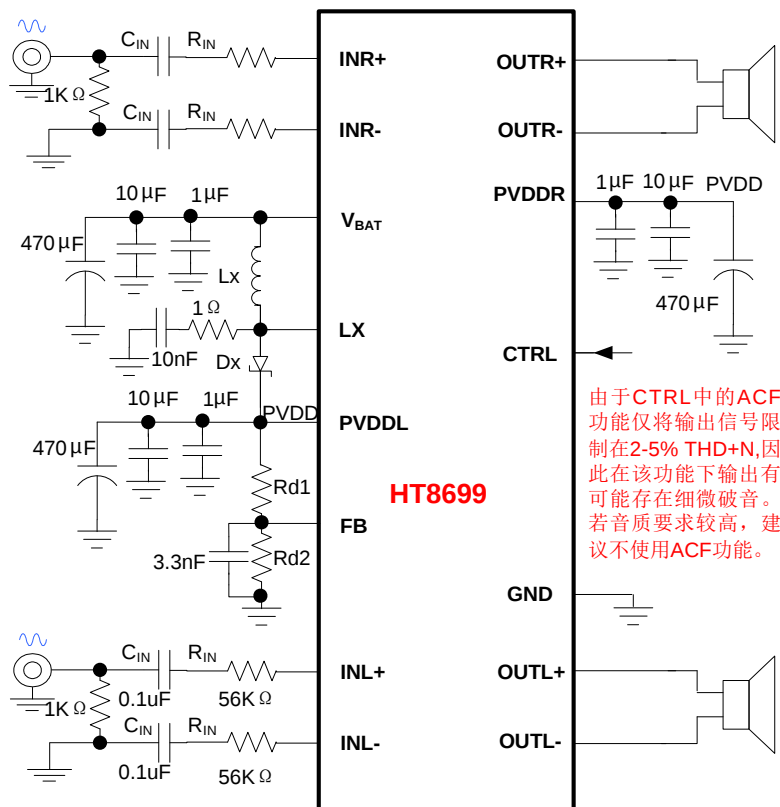
- 防削顶失真功能(Anti-Clipping Function, ACF)
- 免滤波器数字调制，直接驱动扬声器
- 输出功率

2×5.5W($V_{BAT}=4V$, $PVDD=7V$, $R_L=4\Omega$,
THD+N=10%)

- 电源
 - 升压输入 V_{BAT} : 2.5V至5.5V
 - 升压输出PVDD: V_{BAT} 至7.0V
- BOOST输出电压可调
- AB/D类切换
- 过流/过热/欠压异常保护功能
- 无铅封装, SOP16L-PP

芯片料号	内置输入电阻 R_{IN}	工作模式
HT8699RSPEX	17.8K ohm	D类和AB类
HT8699B6SPEX	10 ohm	D类

■ 典型应用图



■ 概述

HT8699是一款内置BOOST升压模块的立体声音频功率放大器。在D类模式下，内置的BOOST升压模块可通过外置电阻调节升压值，即使是锂电池供电，在升压至7V时，10% THD+N，4Ω负载条件下，能连续输出 $2 \times 5.5W$ 的功率。

HT8699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。

HT8699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，HT8699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。

■ 应用

- 蓝牙音箱
- 2.1声道小音箱
- iphone/ipod/ipod docking
- 便携式音箱
- 扩音器
- 便携式游戏机

2×5.5W Stereo Audio Amplifier with Boost Converter

■ FEATURE

- Anti-Clipping Function (ACF)
- Filter-less Modulation, Eliminating Output Filter
- Output Power

$$2 \times 5.5W (V_{BAT}=4V, PVDD = 7V, R_L=4\Omega, THD+N=10\%)$$

- -BOOST Input V_{BAT} : 2.5V to 5.5V
- -BOOST Output PVDD: V_{BAT} to 7.5V
- Adjustable BOOST Output Voltage
- Class AB /Class D available
- Thermal Protection, Over current protection, Low voltage malfunction prevention function included
- Pb-Free Packages, SOP16L-PP

Part No.	Internal Input Resistor R_{IN}	Working Mode
HT8699RSPEX	17.8K ohm	Class D & Class AB
HT8699B6SPEX	10 ohm	Class D

■ APPLICATIONS

- Bluetooth Speakers
- Portable Speakers
- iPhone/iPod/iPod docking
- Megaphone

■ 典型应用图

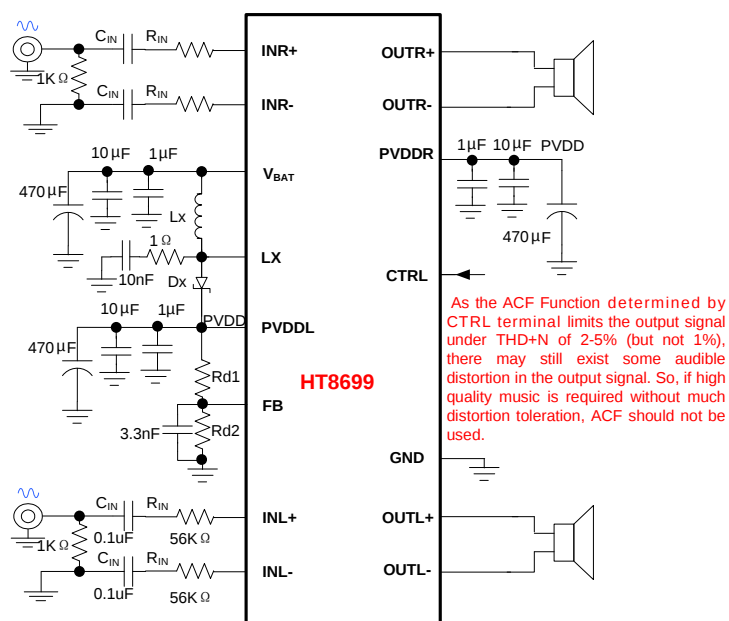
■ GENERAL DESCRIPTION

HT8699 integrates a boost converter with a filter-less stereo class D audio power amplifier to provide $2 \times 5.5\text{W}$ continuous power into a 4Ω speaker when operating from a Li-battery voltage boosted to 7V. Meanwhile, the boost output voltage is adjustable.

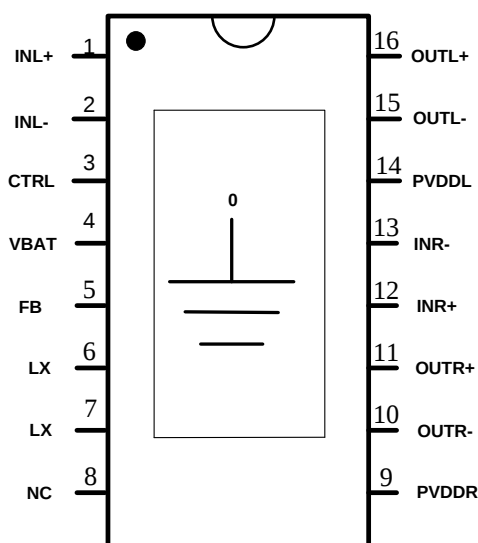
Class AB amplifier mode is also available for HT8699. Once the EMI Interference from class D and Boost Converter becomes an annoying problem, HT8699 can be switched into Class AB mode.

HT8699 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.

HT8699 has the independent Shutdown function which can minimize the power consumption at standby and MUTE function. As for protection function, over current protection, over temperature protection function, and low supply voltage malfunction preventing function are also prepared.



■ TERMINAL CONFIGURATION



SOP16L-PP Top View

■ TERMINAL FUNCTION¹

Terminal No.	Name	I/O	ESD Protection	Function
0	GND	GND	-	Power Ground. Do connect to the system Ground.
1	INL+	I	PN	Left channel positive input (differential +)
2	INL-	I	PN	Left channel negative input (differential -)
3	CTRL	I	PN	Shutdown and ACF control terminal
4	V _{BAT}	Power	PN	Logic Power Supply
5	FB	I	PN	Regulator Feedback Input
6,7	LX	I	-	Internal Switch Input
8	NC			No connection. Connect to GND for better thermal performance
9	PVDDR	Power	-	Boost Converter Output Voltage, Power Supply for Class D Right Channel
10	OUTR-	O	-	Right channel negative output (BTL-)
11	OUTR+	O		Right channel positive output (BTL+)
12	INR+	I	PN	Right channel positive input (differential +)
13	INR-	I	PN	Right channel negative input (differential -)
14	PVDDL	Power	-	Boost Converter Output Voltage, Power Supply for Class D Left Channel
15	OUTL-	O	-	Left channel negative output (BTL-)
16	OUTL+	O		Left channel positive output (BTL+)

¹ I: Input O: Output

ORDERING INFORMATION

Part Number	Available Working Mode	Internal Input Resistor R_{IN}^1	Package Type	Marking	Operating Temperature Range	MOQ/Shipping Package
HT8699RSPER	Class AB & Class D	17.8k ohm	SOP16L-PP	HT8699R _{SP}	-40°C~85°C	Tape and Reel 2500PCS
HT8699RSPET	Class AB & Class D	17.8k ohm	SOP16L-PP	HT8699R _{SP}	-40°C~85°C	Tube / 50 PCS
HT8699B6SPET	Class D	10ohm	SOP16L-PP	HT8699 _{SP}	-40°C~85°C	Tube / 50 PCS
HT8699B6SPER	Class D	10ohm	SOP16L-PP	HT8699 _{SP}	-40°C~85°C	Tape and Reel 2500PCS

ELECTRICAL CHARACTERISTIC

Absolute Maximum Ratings ²

Item	Symbol	Min.	Max.	Unit
Power supply voltage range	V_{BAT}	-0.3	5.5	V
BOOST converter output voltage range	PVDD	V_{BAT}	7.0	V
Input terminal voltage range (IN+, IN-)	V_{IN}	$V_{SS}-0.6$	$PVDD+0.6$	V
Input terminal voltage range (except IN+, IN-)	V_{IN}	$V_{SS}-0.3$	$PVDD+0.3$	V
Operating Ambient Temperature	T_A	-40	85	°C
Junction Temperature	T_J	-40	150	°C
Storage Temperature	T_{STG}	-50	150	°C

Recommended Operating Condition

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Power Supply Voltage ³	V_{BAT}		2.5	3.6	5.5	V
BOOST converter output voltage range	PVDD		V_{BAT}	6.0	7.0	V
Operating Ambient Temperature	T_a		-40	25	85	°C
Speaker Impedance	R_L		4			Ω

¹ See Fig. 3 in Page 12 for detail.

² Absolute Maximum Ratings is values which must not be exceeded to guarantee device reliability. With a system in which supply voltage might exceed supply voltage of PVDD/GND, external diodes are recommended to be used to assure that the voltage does not exceed the absolute maximum rating.

³ The rising time of V_{BAT} should be more than 1 μ s.

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