

# HT6809 产品简介

## *HT6809 Brief Introduction*

中文版 (2-3页)

*English Version (Page 4 - 6)*

# 3W带数字音量控制/防削顶超低EMI立体声D类音频功率放大器

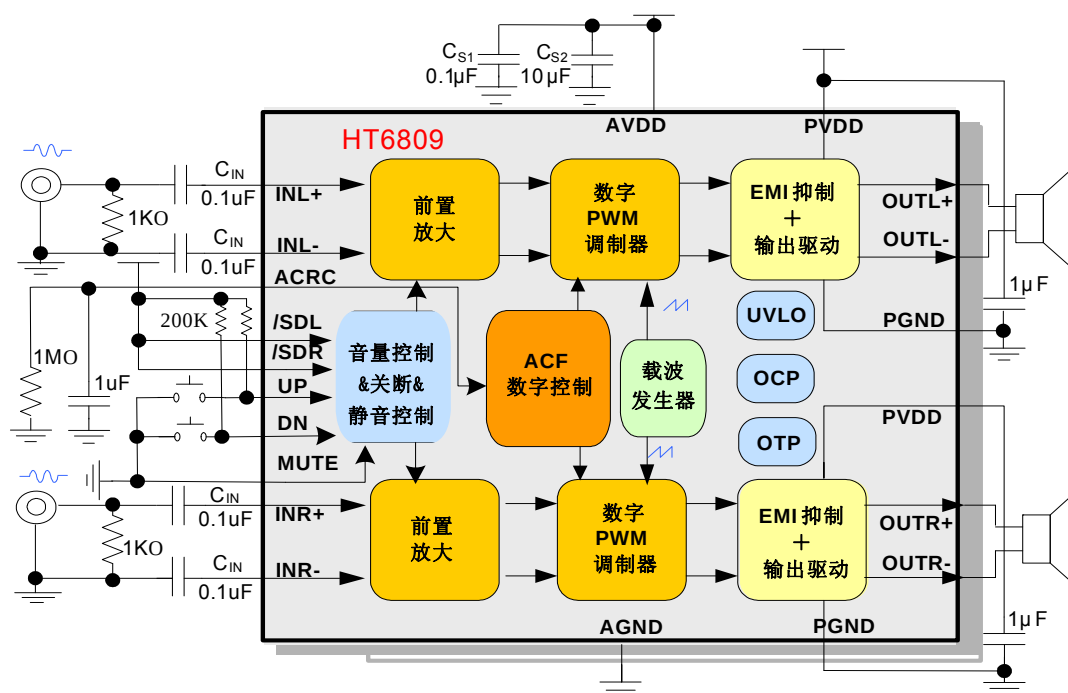
## ■ 特点

- 防削顶失真功能(Anti-Clipping Function, ACF)
- 超优异的全带宽EMI抑制性能
- 免LC滤波器数字调制,直接驱动扬声器
- 32阶数字音量控制(DVC)
- 高输出功率
- 3.0W@ $V_{DDP}=V_{DDA}=5.0V$ ,  $R_L=4\Omega$ , THD+N=10%
- 1.9W@ $V_{DDP}=V_{DDA}=5.0V$ ,  $R_L=8\Omega$ , THD+N=10%
- 高效率
- 85%@ $V_{DDP}=V_{DDA}=5.0V$ ,  $R_L=4\Omega$ ,  $P_O=1W$
- 低THD+N
- 0.1%@ $V_{DDP}=V_{DDA}=5.0V$ ,  $R_L=4\Omega$ ,  $P_O=1W$
- 通道隔离度
- 80dB@ $f_{IN}=1kHz$ ,  $A_v=18dB$
- 高信噪比SNR:
- 90dB@ $V_{DDP}=V_{DDA}=5.0V$ ,  $A_v=18dB$
- 优异的“噼噼-咔嗒”(Pop-Click)噪声抑制性能
- 静音功能
- 独立声道关断
- 过流保护功能、过热保护功能
- 欠压异常保护功能
- 无铅封装,TSSOP-20/QFN-20

## ■ 应用

- 便携式音箱,USB音箱,FM插卡式音箱
- MP3/MP4扩展坞
- 便携式游戏机,数码相框
- 手机,笔记本电脑
- 小尺寸LCD电视/监视器

## ■ 典型应用图



## ■ 概述

HT6809是一款内部集成32阶数字音量控制以及防削顶失真功能且具有超低EMI的立体声免输出滤波器D类音频功率放大器,在电源电压5V、THD+N=10%、4Ω负载的条件下,输出高达3W的功率,在提供媲美于AB类放大器性能的同时,效率高达90%。

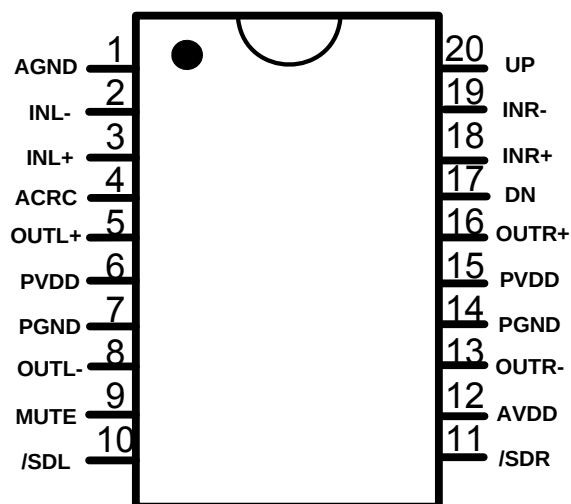
HT6809的最大特点是防削顶失真(ACF)输出控制功能,可检测并抑制由于输入音乐、语音信号幅度过大所引起的输出信号削顶失真(破音),也能自适应地防止在电池应用中由电源电压下降所造成的输出削顶,显著提高音质,创造非常舒适的音乐享受,并保护扬声器免受过载损坏。通过在ACRC端外接不同电阻电容值,可灵活设置放大器的音质和输出功率;同时芯片提供了ACF Off模式。

HT6809采用独有的电磁辐射(EMI)抑制技术,具有超优异的全带宽低辐射性能,辐射水平在不加任何辅助设计时仍远远低于FCC Part15 Class B标准值,降低了系统电磁兼容设计难度。

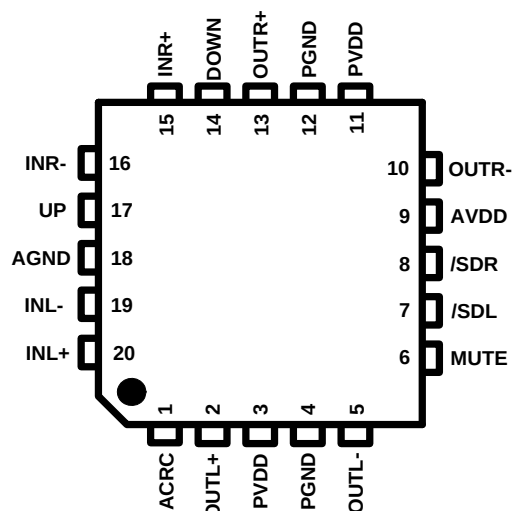
HT6809内部集成免滤波器数字调制技术,能够直接驱动扬声器,并最大程度减小脉冲输出信号的失真和噪音。极少的外部元器件节省了系统空间和成本,是便携式应用的理想选择。

此外,HT6809内置的关断功能使待机电流最小化,还集成了静音功能、左右声道独立关断、扬声器输出端过流保护、片内过温保护和欠压异常保护等功能;采用无铅TSSOP-20和QFN-20封装形式。

## ■ 引脚分布图



20引脚TSSOP 顶视图



20引脚QFN 顶视图

## ■ 订购信息

**H** **T** **6** **8** **0** **9** **XX** **R**

包装和供货形式

封装形式

| 产品型号                     | 封装形式         | 顶面标记                           | 工作温度范围<br>(扩展工业级) | 包装和供货形式        |
|--------------------------|--------------|--------------------------------|-------------------|----------------|
| HT6809MTER <sup>*1</sup> | TSSOP-20     | HT6809<br>XXXXXX <sup>*2</sup> | -40℃~85℃          | 卷带装<br>3000颗/盘 |
| HT6809SQR                | QFNWB4*4-20L | HT6809SQ<br>XXXXXX             | -40℃~85℃          | 卷带装<br>5000颗/盘 |

\*1:MTE代表TSSOP封装,R代表卷带装

\*2:XXXXXX为内部生产跟踪随机编码

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## 3W Ultra Low-EMI Anti-Clipping Stereo Class D Audio Power Amplifier with Digital Volume Control

### ■ FEATURES

- Anti-Clipping Function (ACF)
- Excellent EMI Suppression Performance
- Optimized PWM Output Stage Eliminating Output Filter
- 32 Step Digital Volume Control (DVC)
- Maximum Output
- 3.0 W×2ch ( $V_{DD}=5.0V$ ,  $R_L=4\Omega$ , THD+N=10%)
- 1.9 W×2ch ( $V_{DD}=5.0V$ ,  $R_L=8\Omega$ , THD+N=10%)
- Efficiency
- 85% @  $V_{DD}=5.0V$ ,  $R_L=4\Omega$ ,  $P_O=1W$
- Low THD+N
- 0.1% @  $V_{DD}=5.0V$ ,  $R_L=4\Omega$ ,  $P_O=1W$
- Channel Separation
- 80dB @  $f_{IN}=1kHz$ ,  $A_v=18dB$
- High S/N Ratio
- 90dB @  $V_{DD}=5.0V$ ,  $A_v=18dB$
- Excellent Click-Pop Noise Reduction Function
- MUTE Function
- Independent Channel Power Down Function
- Over-Current Protection Function, Thermal Protection Function
- Low Voltage Malfunction Prevention Function
- Pb-Free Package, TSSOP-20, QFN-20

### ■ APPLICATIONS

- Portable Speakers, USB Speakers, FM Speakers
- MP3/MP4
- Portable Gamers, Digital Photo Frame
- Mobile Phone, Notebook PC
- Small Size LCD TV/Monitors

### ■ GENERAL DESCRIPTION

HT6809 is an internal integrated 32-step digital volume control, ultra Low-EMI, Anti-Clipping stereo Class D audio power amplifier IC with maximum output power of 3W, efficiency up to 90%.

HT6809 features Anti-Clipping Function (ACF) which detects output signal clip due to the over input signal and suppresses the output signal clip automatically. Also the ACF function can adapt the output clip caused by power supply voltage down with battery. It can significantly improves the sound quality, creating a very comfortable musical enjoyment, and to protect the speakers from overload damage. In addition Sound quality and output power can be freely set by external resistance or capacitance of ACRC. HT6809 also supply ACF OFF mode.

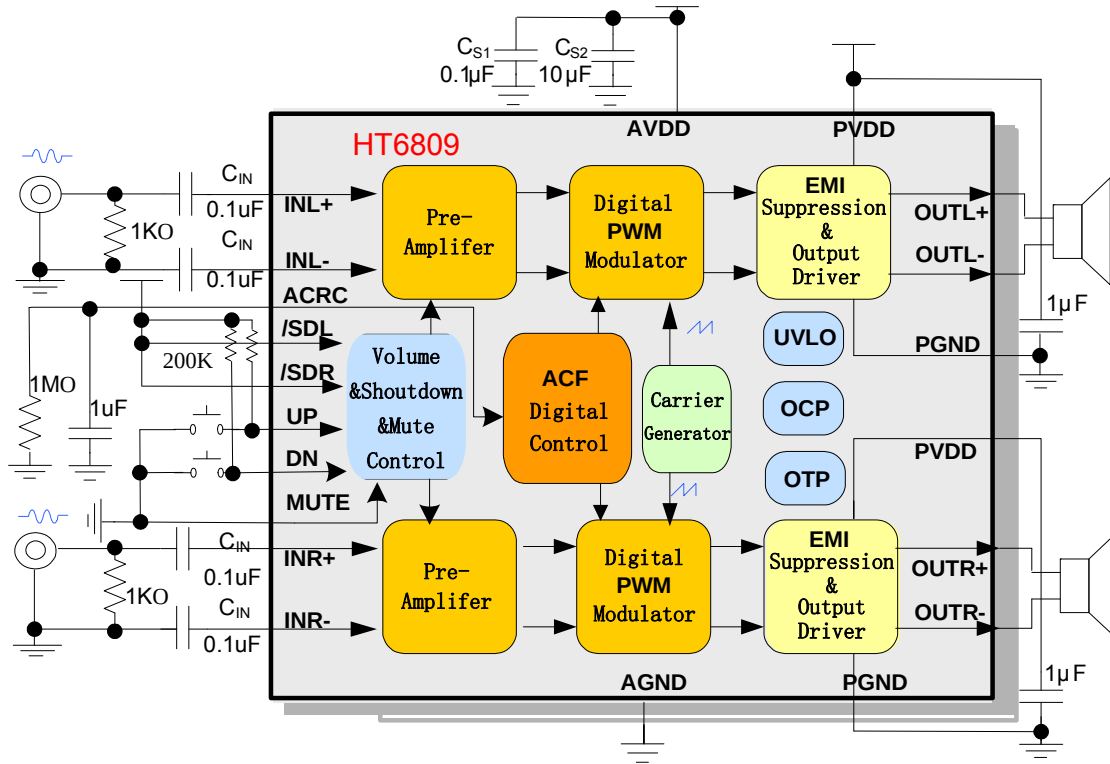
HT6809 has excellent EMI radiation suppression characteristics, well below the FCC Part15 Class B standards, simplifying system design and lowering system cost.

HT6809 has a “Pure Pulse Direct Speaker Drive Circuit” which directly drives speakers while reducing distortion of pulse output signal and reducing noise on the signal, and realizes the highest standard low distortion rate characteristics and low noise characteristics among digital amplifier ICs for portable use.

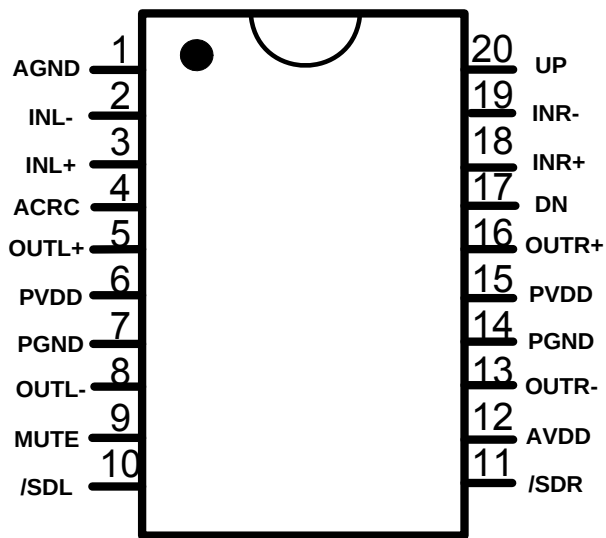
HT6809 has the independent Shutdown function which can minimize the power consumption at standby and MUTE function. As for protection function, over current protection function for speaker output terminals, over temperature protection function, and low supply voltage malfunction preventing function are also prepared.

HT6809 is available in Pb-Free TSSOP-20 and QFN-20 package.

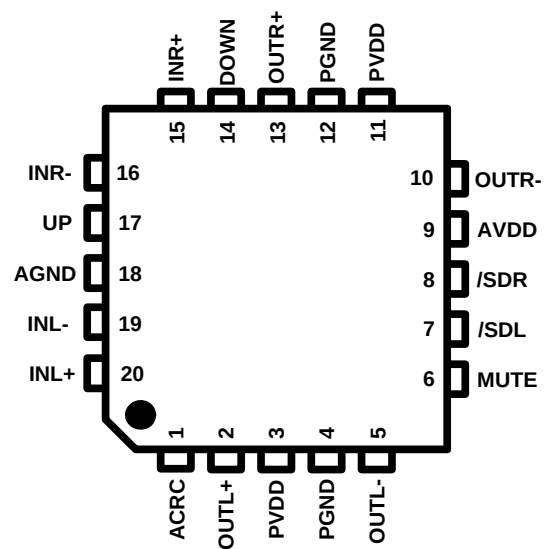
## ■ TYPICAL APPLICATION



## ■ TERMINAL CONFIGURATION



TSSOP-20 Top View



QFN-20 Top View

**■ ORDERING INFORMATION**

|   |   |   |   |   |   |     |   |
|---|---|---|---|---|---|-----|---|
| H | T | 6 | 8 | 0 | 9 | MTE | R |
|---|---|---|---|---|---|-----|---|

Shipping Package

Package type

| Part Number | Package Type | Marking              | Operating Temperature Range | MOQ/Shipping Package         |
|-------------|--------------|----------------------|-----------------------------|------------------------------|
| HT6809MTER  | TSSOP20/pp   | HT6809<br>XXXXXX*1   | -40℃~85℃                    | Paper bags<br>3000 PCS/Plate |
| HT6809SQR   | QFNWB4*4-20L | HT6809SQ<br>XXXXXX*1 | -40℃~85℃                    | Paper bags<br>5000 PCS/Plate |

\*1: "XXXXXX" is production track code.

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